

# CALIFORNIA INSTITUTE OF TECHNOLOGY

EARTHQUAKE ENGINEERING RESEARCH LABORATORY

## ANALYSES OF STRONG MOTION EARTHQUAKE ACCELEROGRAMS

VOLUME IV - FOURIER AMPLITUDE SPECTRA

PARTS T AND U - ACCELEROGRAMS IT274 TO IT293  
AND IU294 TO IU313

REPORT NO. EERL 75-100

A REPORT ON RESEARCH CONDUCTED UNDER A  
GRANT FROM THE NATIONAL SCIENCE FOUNDATION

PASADENA, CALIFORNIA

MARCH, 1975

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## ABSTRACT

This is one of a series of reports presenting Fourier amplitude spectra for earthquake ground motions and for structural response accelerations. Volume IV, Part A, Report No. EERL 72-100, included an introduction summarizing Fourier spectrum techniques in earthquake engineering as a background to the use of the data. For each earthquake accelerogram, two spectrum plots are given - a Fourier amplitude spectrum versus frequency on a linear scale and a log-spectrum, log-frequency plot. In this Volume IV series, Fourier amplitude spectra will be given for all corrected accelerograms, including building response measurements. The corrected records analyzed in this report, Volume IV, Parts T and U, appeared in Volume II, Part T, Report No. EERL 75-50, and Volume II, Part U, Report No. EERL 75-51. Their uncorrected versions were published in Volume I, Part T, Report No. EERL 73-25, and Volume I, Part U, Report No. EERL 73-26.

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## PREFACE TO VOLUME IV, PARTS T AND U

This report, Volume IV, Parts T and U,\* Report No. EERL 75-100, is part of the Volume IV series presenting Fourier spectrum curves calculated from corrected strong-motion accelerograms including measurements in structures as well as at ground sites. This issue contains data from the instrument at the El Centro, California, site in the basement of the Imperial Valley Irrigation District substation, together with other Western United States stations, which recorded strong ground motion during the years 1934 to 1967.

Five El Centro records have already appeared in the project in Parts A and B. These were obtained in 1934 (B024), 1940 (A001), 1956 (A011 and A012) and 1968 (A019). In this issue we complete the El Centro records suitable for digitization that were obtained from 1938 to 1966. The actual dates and times are shown in the Index of Earthquake Records. Of particular interest are the nine groups of aftershocks of the May 18, 1940, event, all recorded on the same triggering as the main shock and therefore with their relative arrival times available.

The Ferndale, California, site provided records in 1934, 1937, 1960 and 1967, in addition to those records already appearing in Parts A and B: 1938, 1941, 1951, 1952 and 1954. The Hollister, California, site is represented here with records in 1949, 1954, 1960, 1961 (at 2325 hours on April 8) and 1967, supplementing the one record

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\*For reasons of economy and convenience in the size of the reports, it has been thought desirable to combine two parts into one report.

appearing in Part A at 2323 hours on April 8, 1961. Although this record at 2325 hours on April 8, 1961 is from an aftershock (M 5.5) of the main shock (M 5.7) occurring two minutes earlier at 2323 hours, nonetheless it has been included in many of the statistical investigations which have had, as basic data, the entire set of records in this digitizing and analysis project. In these instances, both records have been assigned to the main shock at 2323 hours.

Also included is a series of three aftershocks of the October 18, 1935 Helena, Montana, earthquake recorded at the Federal Building in Helena on October 31 at 1218 hours, November 21 and November 28. Already appearing in Part B was the second largest shock, on October 31 at 1138 hours. There was no accelerograph in Helena for the main shock on October 18, but the next day the United States Coast and Geodetic Survey sent an accelerograph and a vibration meter from California to Helena with a strong-motion party under F. P. Ulrich. This accelerograph provided the above set of records.

Another set of aftershocks was recorded at the Fire House, in Tehachapi, California, following the Taft earthquake of July 21, 1952. These were labeled on the original records as the 1st, 2nd and 5th aftershocks, occurring in the time period July 23 to July 31, 1952. No detailed times were available.

Other records in this issue include Santa Barbara (1941); the 13th floor of the Bank of America Building, San Jose, California (1955), the basement record having appeared in Part A, Reference Number IA010; Seattle, Washington (1965); and Taft, California (1966).

The uncorrected versions of these records appeared in Volume I, Parts T and U, Report Nos. EERL 73-25 and 73-26, and the plotted

corrected accelerations, velocities, and displacements were included in Volume II, Parts T and U, Report Nos. EERL 75-50 and 75-51. These Volume II corrections included a standard long period cut-off of approximately 15 seconds.

A number of very low amplitude accelerograms have been eliminated from the processing of Volume II and on, reflecting the expectation that the resulting displacements would be dominated by noise. None of the records in Parts T and U are included in this group of accelerograms.

A separate section included in Volume IV, Parts Q, R, and S, Report No. EERL 74-104, entitled "High Frequency Amplitude Errors in Digitized Strong Motion Accelerograms" describes the results of a recent investigation of high frequency noise generated by the digitizing process. Frequencies from several to 25 Hz have been studied, and figures have been included to indicate clearly the extent to which Fourier amplitudes have been affected within this range.

## NOTES ON THE VOLUME IV SERIES

Description of the Four Volumes of the Project. The series of reports in Volume I present "uncorrected" digitized and plotted strong-motion earthquake accelerograph data, while the series in Volume II present corrected digitized data prepared so that the maximum information over the widest practicable frequency range would be available. The corrections include long period filtering ensuring to the greatest extent possible a uniform type of baseline adjustment and an instrument correction to account for the high frequency response characteristics of the accelerograph transducer.

The Volume III series presents earthquake response spectrum curves calculated from the corrected accelerograms of Volume II, while the Volume IV series contains Fourier amplitude spectra calculated by the Fast Fourier Transform algorithm. An extensive introduction was prepared for Volume IV, Part A, Report No. EERL 72-100, where details of the methods used can be found together with examples of applications to various problems of earthquake engineering and strong-motion seismology. That introduction should also serve as a basic summary of background information for users of the data.

Contents of the Various Parts. The specific records whose "uncorrected" digitized versions appeared in Part A of Volume I are included subsequently with their analyses in Part A of Volume II, III, and IV. This arrangement has been maintained throughout the whole series. In Part C of Volume IV, Report No. EERL 73-101, we began the presentation of Fourier spectra analysis for the

unusually important series of accelerograms obtained during the San Fernando earthquake of February 9, 1971, and Part S contains the last of the San Fernando records. In Part T a return is made to those records received during the years 1933 to 1968, which continue into Parts U and V. Parts W and X contain the records from the Lytle Creek, California, earthquake of Sept. 12, 1970, and Part Y contains the records of the Borrego Mountain, California, earthquake of April 8, 1968, not already included in Parts A and B. Part Y marks the conclusion of the current digitizing and analysis project.

Component Directions. A description of the component direction nomenclature for the records was given in Volume II, Part B, Report No. EERL 72-50. Consistent with this, the component direction where it appears in this report refers to the direction of the transducer pendulum motion for the trace to be deflected "up" on the record when viewed in the normal way with time increasing from left to right. The direction of true ground acceleration is opposite to this pendulum motion. The spectral calculations of Volume IV, however, are concerned with the amplitude spectrum only and the particular component sense is thus immaterial.

Assessment of Long Period Errors.

A. San Fernando earthquake data, 70-mm and 35-mm film,  
included in Parts C through S

A separate section in Volume II, Part G, Report No. EERL 73-52, entitled "Current Assessment of Long Period Errors" describes the results of a recent investigation of long period displacements calculated from recorded accelerations. During the course of this

study it became evident that the procedures for preparation of 70-mm film and, to a lesser extent, 35-mm film records from the San Fernando earthquake of February 9, 1971, introduced spurious excitations at periods close to the duration of the sectional enlargements. These effects have been removed from all of the 70-mm and 35-mm film records by filtering with a long period limit of 8 seconds rather than the standard cut-off period of 16 seconds in the Volume II correction procedure. The following list of Caltech reference numbers indicates the records from the San Fernando earthquake included in Volume I, Parts C through S, that have been processed with the cut-off period of 8 seconds:

Parts G, H, I: All records in these parts.

Part J: Records J142 and J145 through J150.

Part K: All records.

Part L: Records L166, L167, L168; L172 through L175.

Part M: Records M176, M177, M178; M180 through M184.

Part N: All records.

Part O: Records O198 through O201; O206, O208, O210.

Part P: Records P231 and P232.

Parts Q, R, S: All records in these parts.

A decision was also made at the same time to eliminate a number of very low amplitude accelerograms from further processing (Volume II, III, and IV) reflecting the expectation that the resulting displacement records will be dominated by noise. Their Caltech reference numbers are as follows:

H127; I140; J151, J152; K153 through K156, K161 through K165; O202, O203, O209, O211, O212; P224 through P230.

B. Six inch and twelve inch photographic paper records, included in Parts A through Y.

The decision to eliminate the very low amplitude accelerograms of the San Fernando earthquake, detailed above in Section A, was extended to include the more distant records of the Lytle Creek earthquake, Sep. 12, 1970, whose uncorrected data appeared in Volume I, Part X. This entire Part has been eliminated from further processing. Although this somewhat drastic action was required in this case, nevertheless it is apparent in some of the displacement plots that have reached the Volume II series of reports that some long period noise is still present in the published data. There are no components remaining with periods longer than the cut-off period of 14 seconds (and roll-off termination at 20 seconds), or in the case of 70- and 35-mm film records from the San Fernando earthquake, the cut-off of 8 seconds (and roll-off termination at 10 seconds), but it is evident that for some records these cut-off periods are in fact too long. The cause for this lies in the very low amplitude of acceleration for much of the duration of some of the records and the consequent lowering of the signal-to-noise ratio. This noise arises primarily from random digitization noise, and is independent of the acceleration amplitudes. With this in mind, the displacement plots indicate that a cut-off period lower than 14 seconds, or 8 seconds as the case may be, should be used to remove these components

from the acceleration data. It is clear, of course, that in routine processing of accelerograms, such as those mentioned above, it is not practical to examine each earthquake accelerogram in sufficient detail to permit selection of the cut-off period optimal for that particular record.

Description of the Figures and Tables. For each component in the following pages the Fourier amplitude spectrum is presented in two forms - a linear plot and a log-log plot. Details concerning identification are given at the top of each plot. The second line gives the name, date, and time of occurrence of the earthquake; the third line is comprised of two labels, the observation station and the component processed. The Roman numeral "IV" in the first identification label indicates that the results pertain to the fourth stage of data processing, i. e., Volume IV of Fourier spectra of accelerogram records already corrected for baseline adjustment and instrument response. The letter following the Roman numerals indicates the part of Volume II to which the processed record belongs. The three-digit number completing the first label is the Caltech Reference Number for the given earthquake record in Volume I, right-adjusted in a three-digit numerical field. The second label is a string of three numbers separated by periods; the first number gives the year in which the earthquake occurred; the second is the serial number of the record as it was received at the Caltech Earthquake Engineering Research Laboratory during that year; and the last number indicates whether it was a main event or an aftershock (sequentially numbered, the main event starting from zero). On the linear spectrum plot, the data lying



above the 95 percent confidence level may be considered relevant to that degree. The spectra have been plotted up to a frequency of 25 cyc/sec on linear and logarithmic scales, corresponding to the capabilities of the instrumentation and data processing methods used.

Frequency Transfer Functions. This report presents many spectra of accelerograms recorded simultaneously at different locations in the same structure, for example, the basement, mid-height, and roof levels of a tall building. At present, it is planned to calculate frequency transfer functions involving smoothing and calculating the ratio of two such spectra in supplementary reports.

Numbering of EERL Reports. The system for the EERL-numbering of the reports is based on two numbers, one indicating the year of preparation, and the second indicating the volume to which the report belongs. A detailed description follows.

For the Volume I reports, the first number indicates the year in which the particular data was first prepared for either a report or for loading onto magnetic tape. This number ranges from 70 to 73. The first printing of Volume I, Part A, appeared before the numbering system was chosen. Although it was dated July, 1969, it actually did not appear until 1970, and was consequently numbered EERL 70-20 in subsequent printings. For the reports of Volumes II, III, and IV, the first number indicates the year in which the report was prepared, and ranges from 70 to 75.

The second number increases consecutively with each report, restarting at 20 each year in the case of Volume I reports, at 50 for Volume II, and 80 for Volume III, and at 100 for Volume IV. For

example, Volume II, Part G, Report No. EERL 73-52, was prepared in 1973 and was the third report of the Volume II series to be published that year. The numbers from 01 to 19 each year are reserved for other publications of the Earthquake Engineering Research Laboratory, such as thesis reports and special reports.

Acknowledgments. The cooperative efforts of many people are essential in the preparation of a series of reports of this kind and we have been fortunate in the quality of staff that has carried out the various details with special care and attention. We should like to express our appreciation to Mr. Vincent Lee for his assistance with many details of computer programming, to Miss Barbara Turner and Miss Sharon Vedrode for the care taken over typing and editing, to the staff of the Willis H. Booth Computing Center for their continued help with all aspects of the computing process, and to the staff of the Caltech Graphic Arts Facilities for very efficient work on publication details. The whole project has been made possible by the continued support of the National Science Foundation, supplemented in an important way by contributions from the Earthquake Research Affiliates Program of the California Institute of Technology.

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INDEX OF EARTHQUAKE RECORDS

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IVT278; +84.0 sec	44
IVT279; +101.5 sec	50
IVT280; +125.0 sec	56
IVT281; +154.0 sec	62
IVT282; +203.0 sec	68
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IVT284; +285.5 sec	80
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# EARTHQUAKE DATA, PART T

<u>Location</u>	<u>Date</u>	<u>Time</u>	<u>Lat. (N)</u>	<u>Long. (E)</u>	<u>Depth*</u> (km)	<u>Mag.</u>	<u>Maximum Intensity</u>
Imperial Valley, Calif.	4. 12. 38	0825 PST	32°53'00"	-115°35'00"	16.0	3.0	-
Imperial Valley, Calif.	6. 06. 38	1842 PST	32°54'00"	-115°13'00"	16.0	5.0	-
Imperial Valley, Calif.	6. 06. 38	0435 PST	32°15'00"	-115°10'00"	16.0	4.0	-
Imperial Valley, Calif.	5. 18. 40	2037 PST	32°44'00"	-115°30'00"	16.0	6.7	10
		+45.5 sec					
		+84.0 sec					
		+101.5 sec					
		+125.0 sec					
		+154.0 sec					
		+203.0 sec					
		+242.0 sec					
		+285.5 sec					
		+313.0 sec					
Borrego Valley, Calif.	10.21.42	0822 PST	32°58'00"	-116°00'00"	16.0	6.5	7
Imperial Valley, Calif.	1. 23. 51	2317 PST	32°59'00"	-115°44'00"	16.0	5.6	7
Imperial Valley, Calif.	6. 13. 53	2017 PST	32°43'00"	-115°43'00"	16.0	5.5	7
Lower California	11.12.54	0427 PST	31°30'00"	-116°00'00"	16.0	6.3	5
Imperial County, Calif.	12.16.55	2117 PST	33°00'00"	-115°30'00"	16.0	4.3	-
Imperial County, Calif.	12.16.55	2142 PST	33°00'00"	-115°30'00"	16.0	3.9	7
Imperial County, Calif.	12.16.55	2207 PST	33°00'00"	-115°30'00"	16.0	5.4	-
Gulf of California	8.07.66	0936 PST	31°48'00"	-114°30'00"	16.0	6.3	6

This is the main shock data, revised from that published in Volume I, Part A. There is no corresponding data available on the nine segments of aftershocks, commencing at the times indicated on the left.

\*No actual depths are available. Epicenter calculations have used travel times for 16 km focal depth (Gutenberg, 1951; Hileman et al., 1973).

## EARTHQUAKE DATA, PART U

<u>Location</u>	<u>Date</u>	<u>Time</u>	<u>Lat. (N)</u>	<u>Long. (E)</u>	<u>Depth* (km)</u>	<u>Mag.</u>	<u>Maximum Intensity</u>
Eureka, Calif.	7.06.34	1449 PST	41°42'00"	-124°36'00"	-	-	5
Helena, Mont. (Aftershock)	10.31.35	1218 MST	46°37'00"	-111°58'00"	-	-	3
Helena, Mont. (Aftershock)	11.21.35	2058 MST	46°36'00"	-112°00'00"	-	-	6
Helena, Mont. (Aftershock)	11.28.35	0742 MST	46°37'00"	-111°58'00"	-	-	6
Humboldt Bay, Cal.	2.06.37	2042 PST	40°30'00"	-125°15'00"	-	-	5
Santa Barbara, Cal.	6.30.41	2351 PST	34°22'00"	-119°35'00"	16	5.9	8
Northern Cal.	10.03.41	0813 PST	40°36'00"	-124°36'00"	-	6.4	7
Northern Cal.	3.09.49	0429 PST	37°06'00"	-121°18'00"	-	3.5	7
Kern County, Cal. (A'shocks)	7.23.52 to 7.31.52		35°17'00"	-118°39'00"	-	-	-
Central Calif.	4.25.54	1233 PST	36°48'00"	-121°48'00"	-	5.3	7
San Jose, Calif.	9.04.55	1801 PST	37°22'00"	-121°47'00"	-	5.8	7
Central Calif.	1.19.60	1926 PST	36°47'00"	-121°26'00"	-	5.0	6
Northern Calif.	6.05.60	1718 PST	40°49'00"	-124°53'00"	-	5.7	6
Hollister, Cal. (Aftershock)	4.08.61	2325 PST			-	5.5	-
Puget Sound, Wash.	4.29.65	0729 PST	47°24'00"	-122°18'00"	-	6.5	8
Parkfield, Cal.	6.27.66	2026 PST	35°57'18"	-120°29'54"	6.0	5.6	7
Northern Cal.	12.10.67	0407 PST	40°30'00"	-124°36'00"	-	5.8	6
Northern Cal.	12.18.67	0925 PST	37°00'36"	-121°47'18"	-	5.2	6

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\*The listed depth of 16 km is an estimate used for travel times in epicenter calculations (Gutenberg, 1951; Hileman et al., 1973).

REFERENCES (See additional list, page 260)

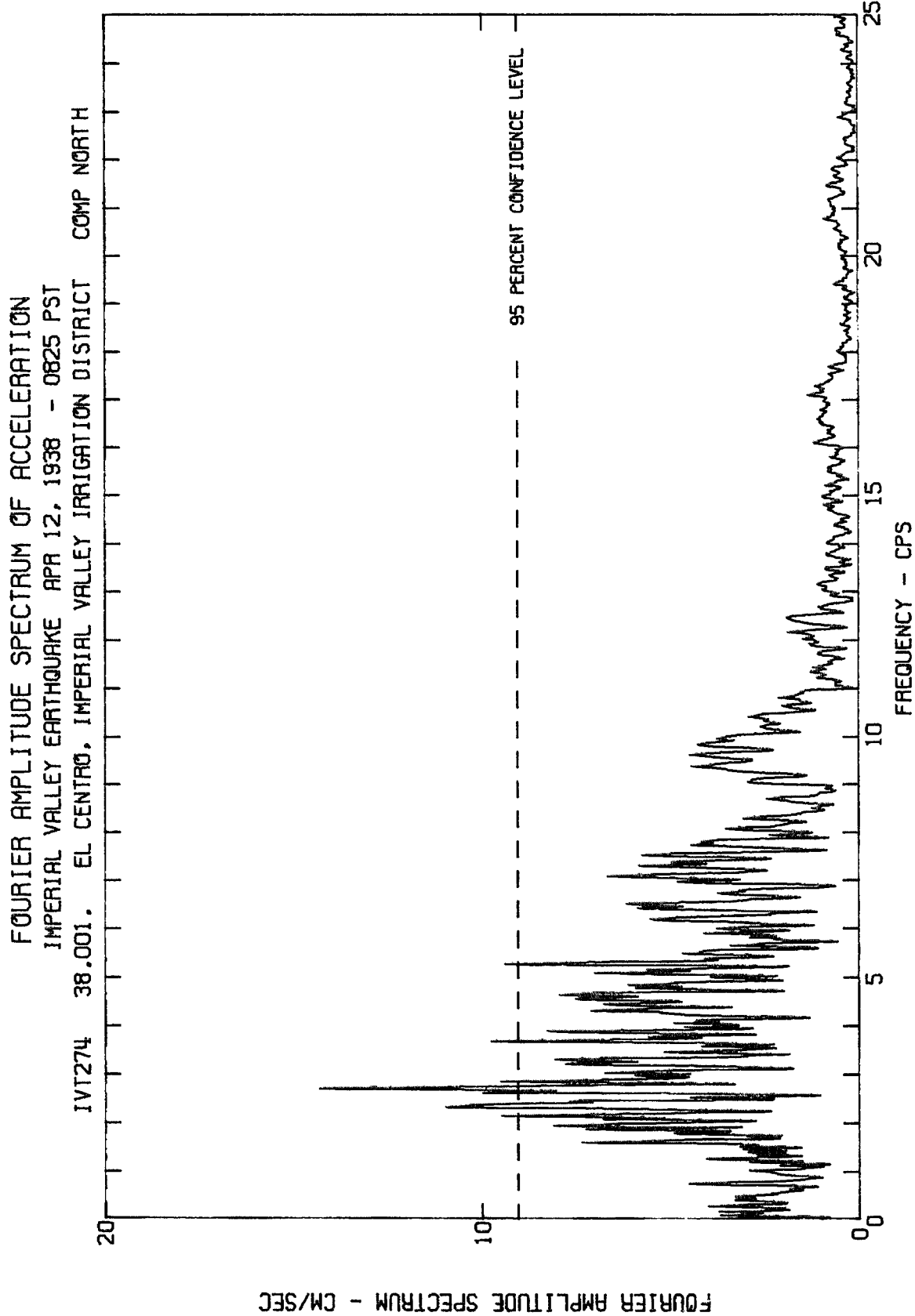
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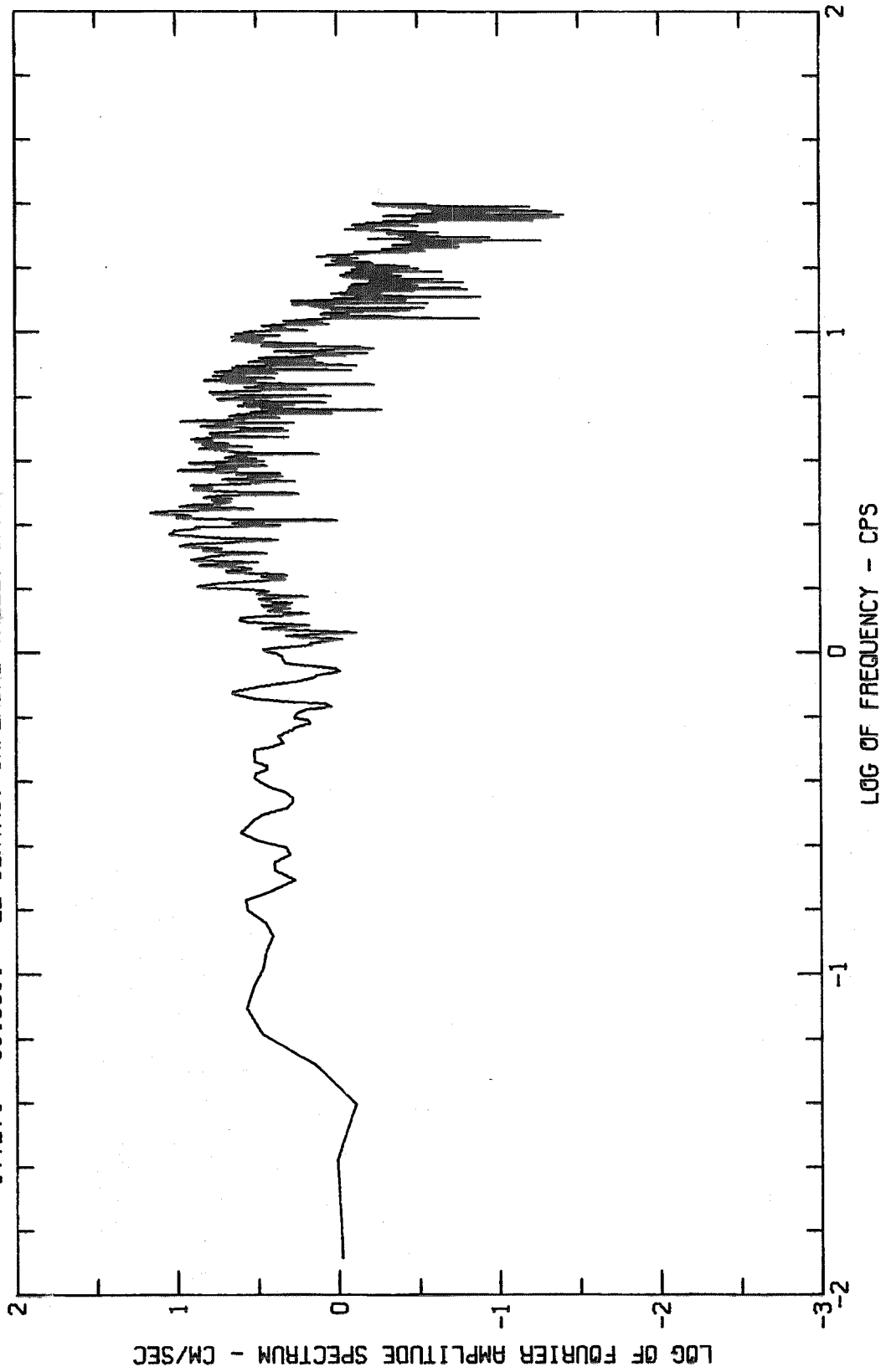
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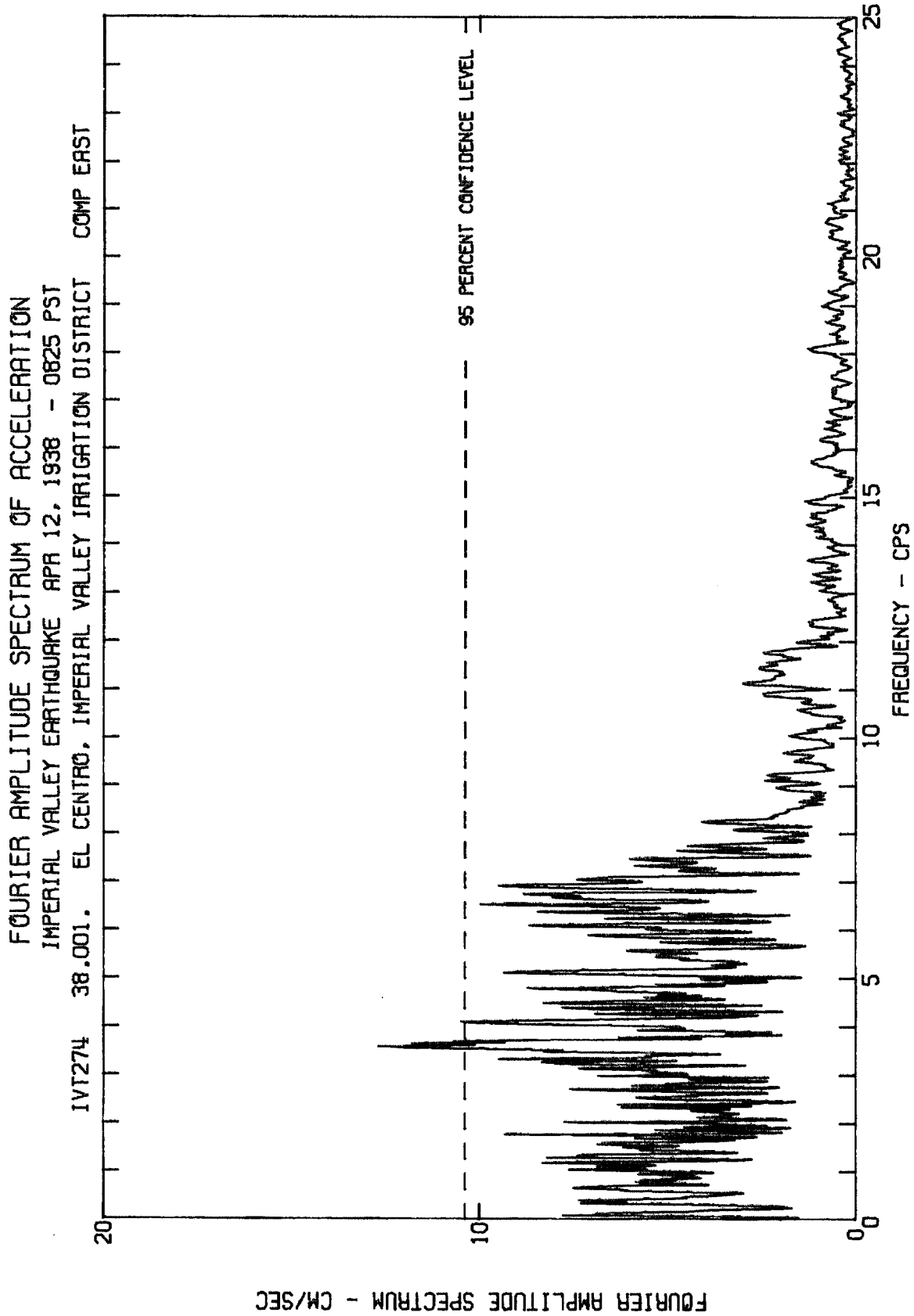
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FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EARTHQUAKE APR 12, 1938 - 0825 PST  
IVT274 38.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH

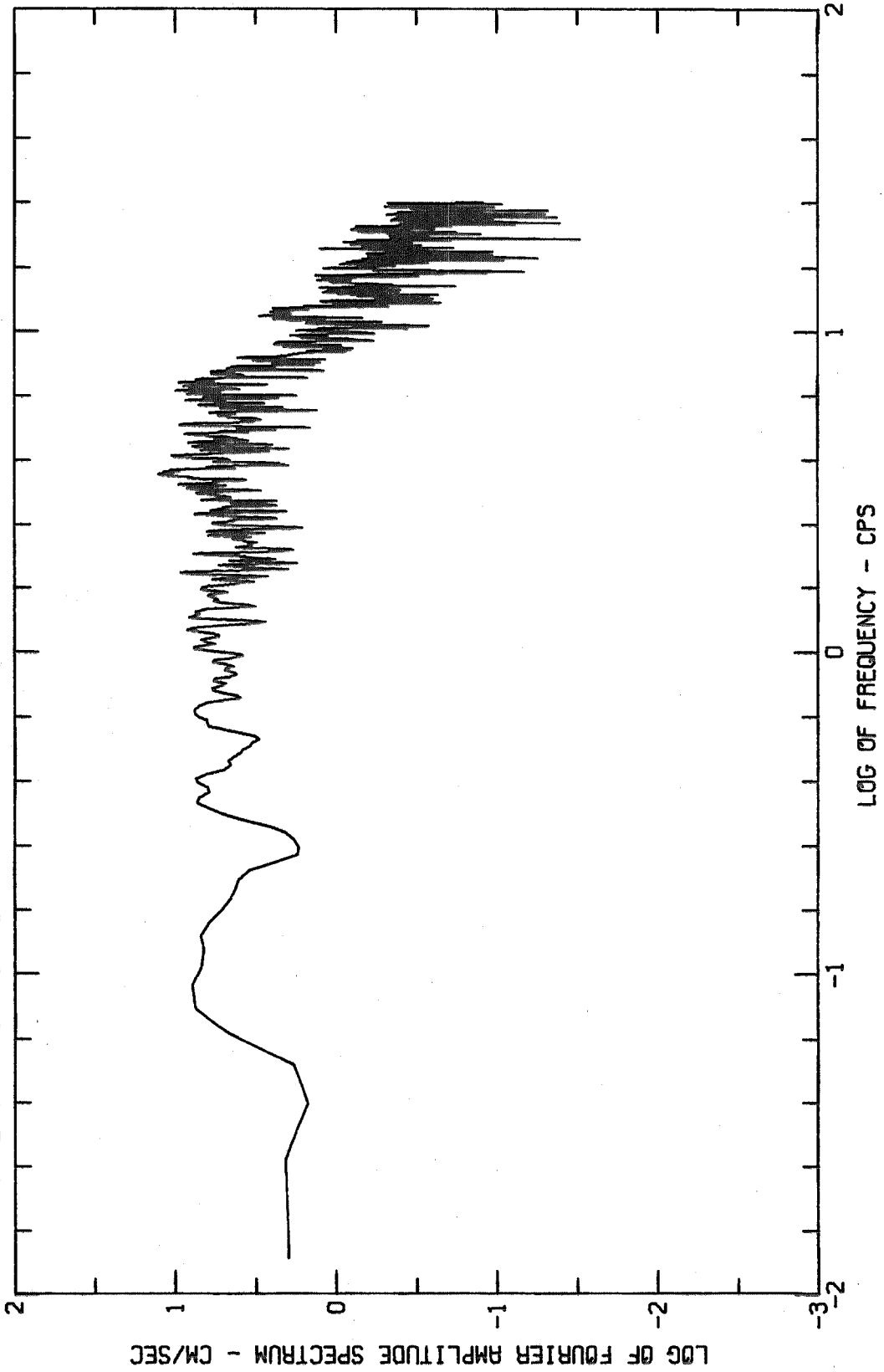


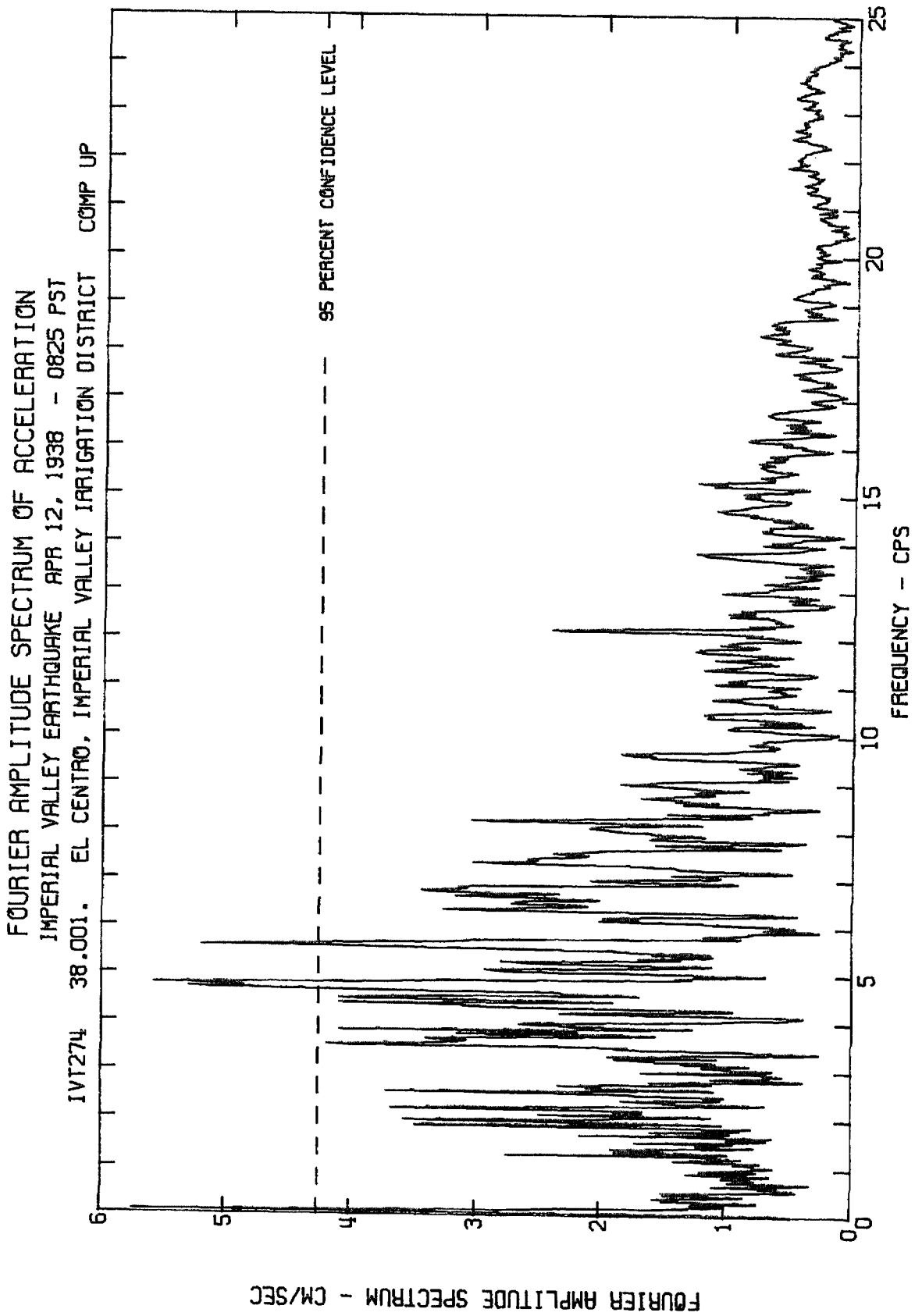


IVT274 38.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION

IMPERIAL VALLEY EARTHQUAKE APR 12, 1938 - 0825 PST



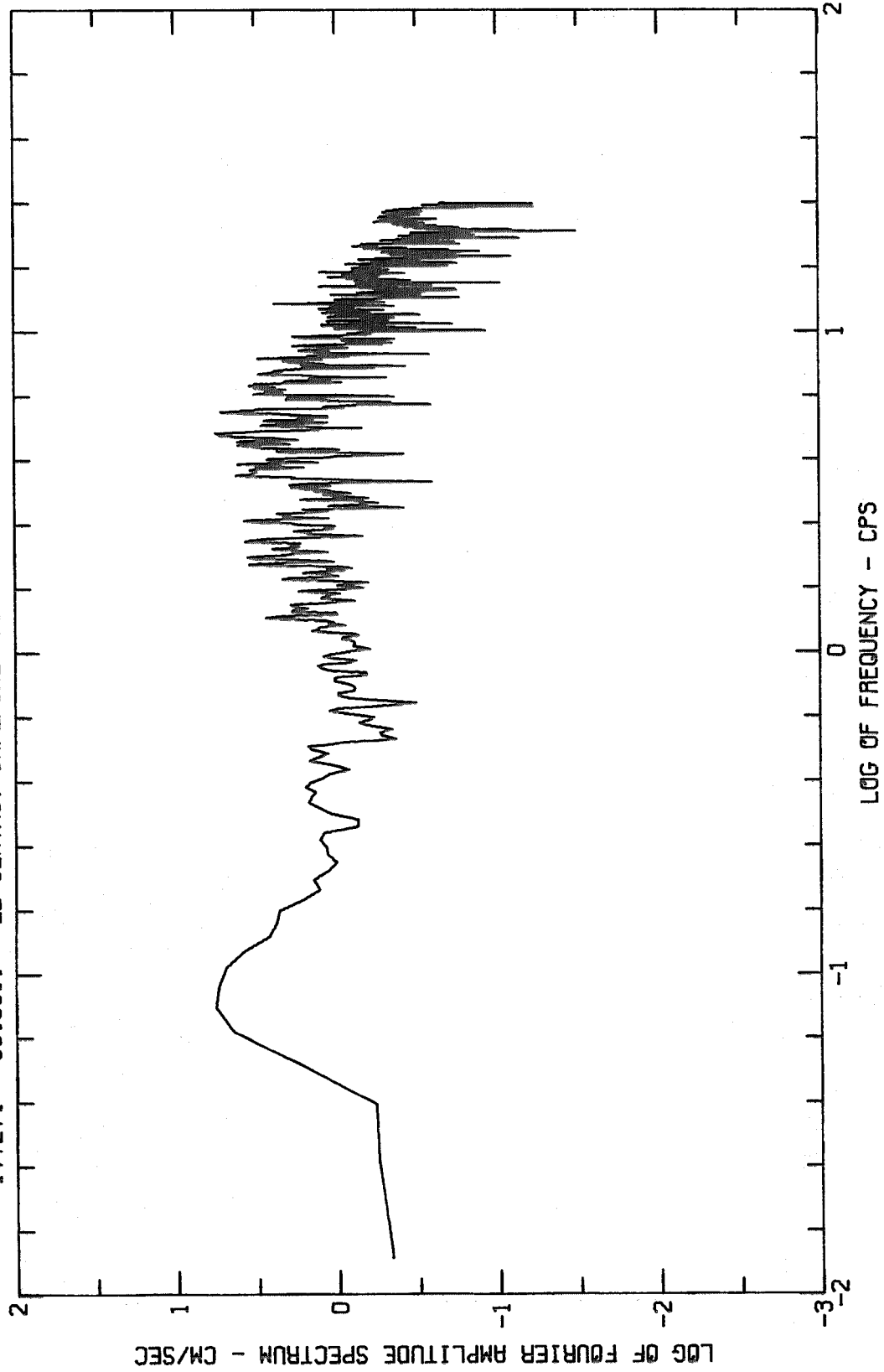


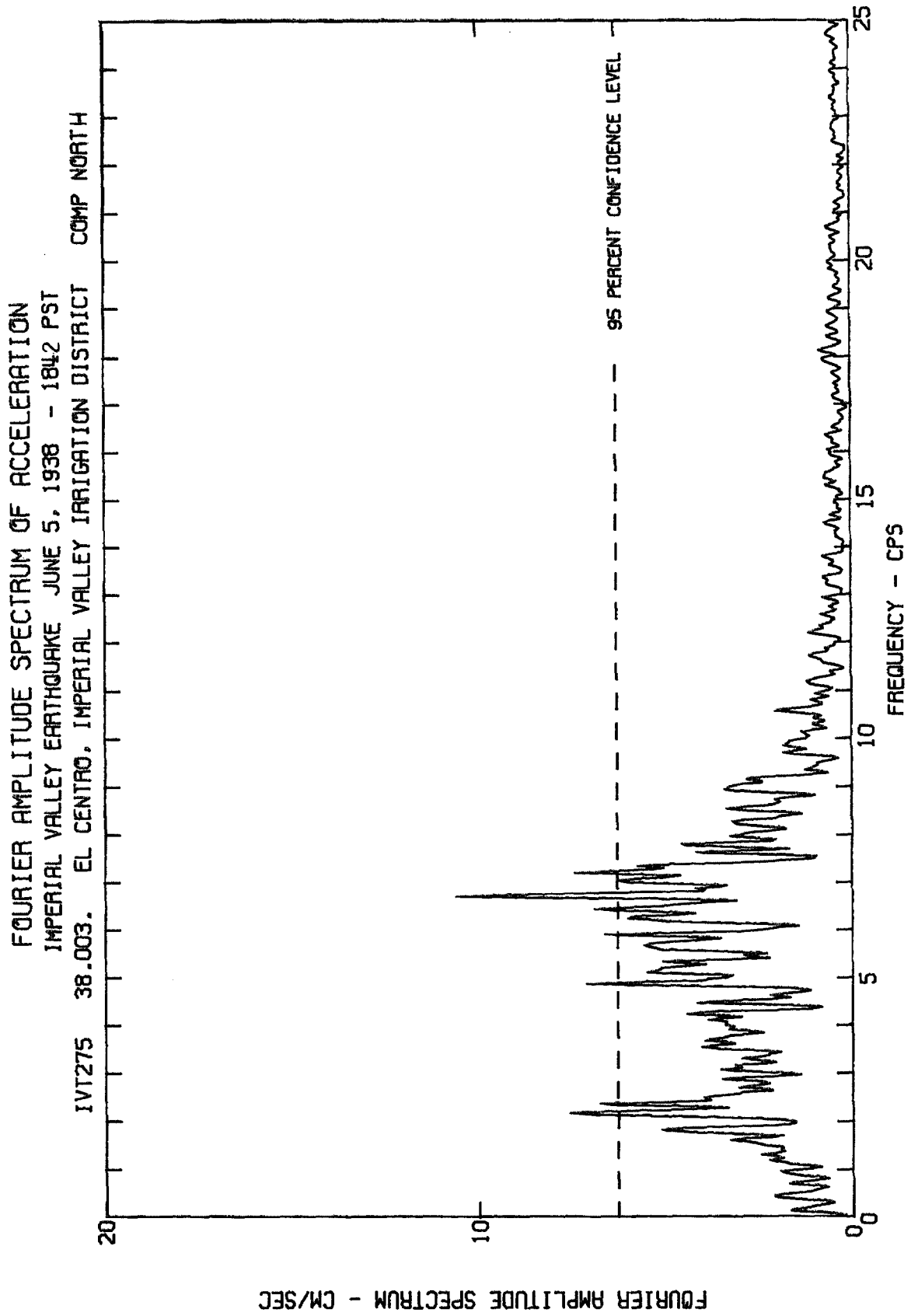


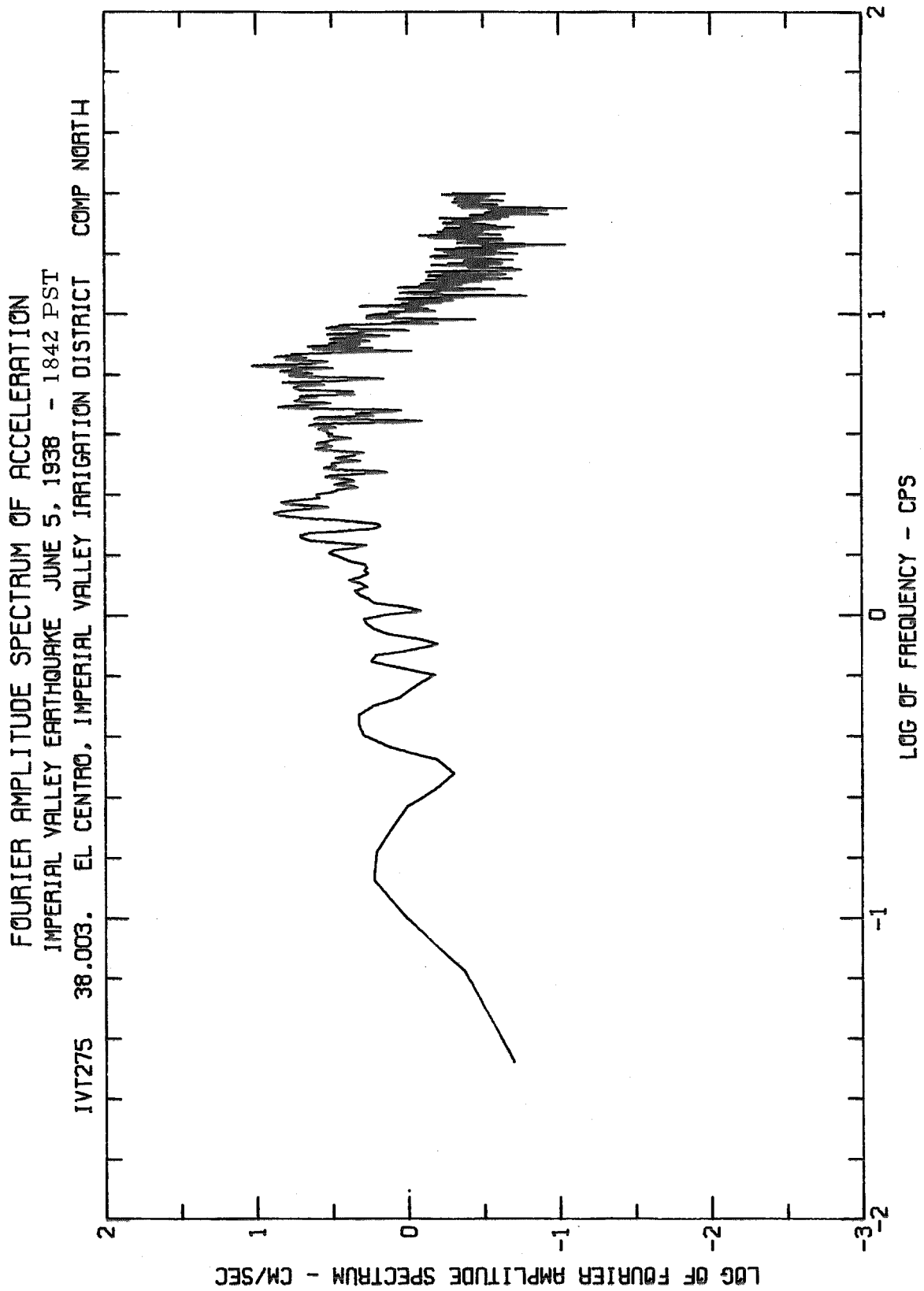
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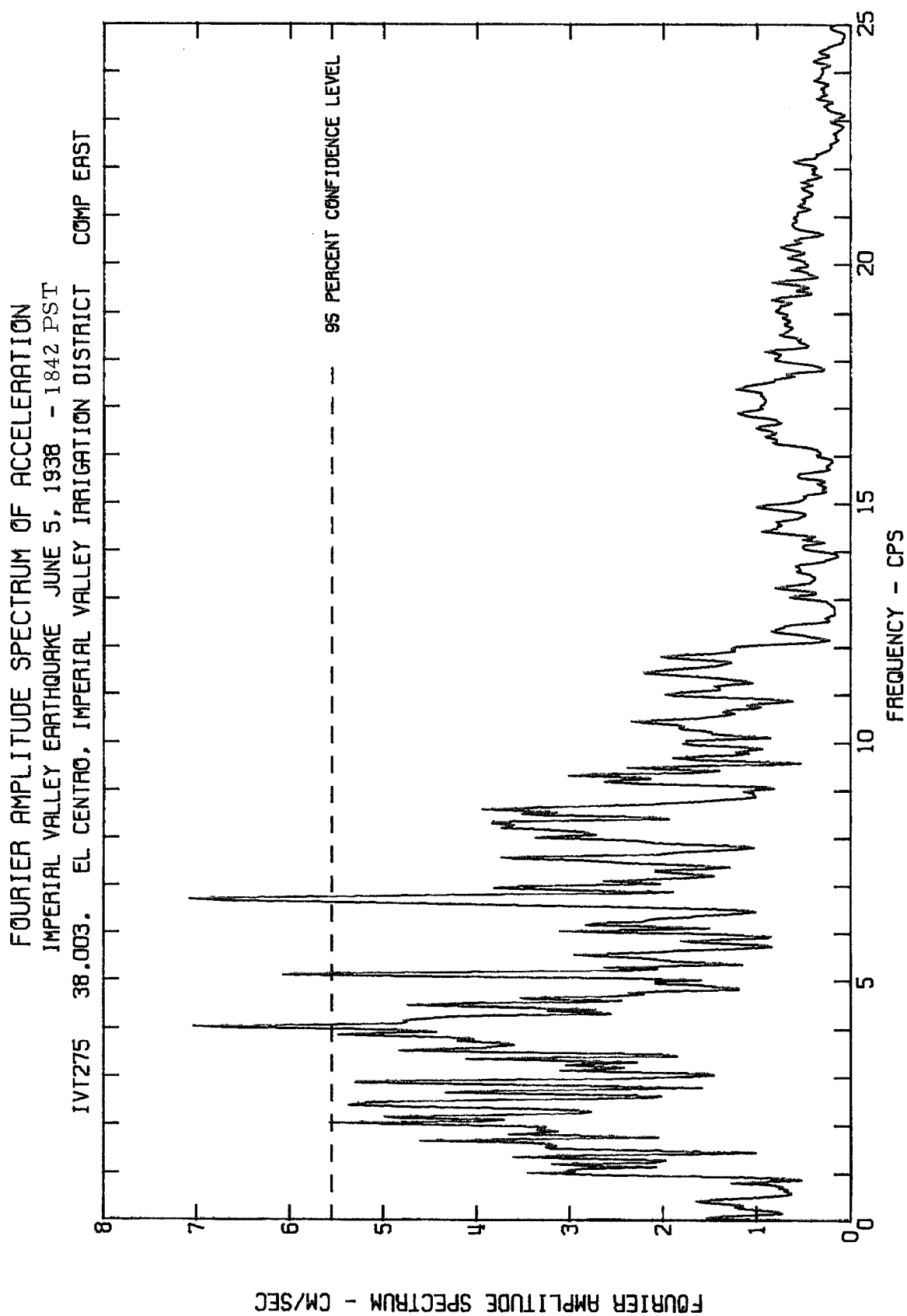
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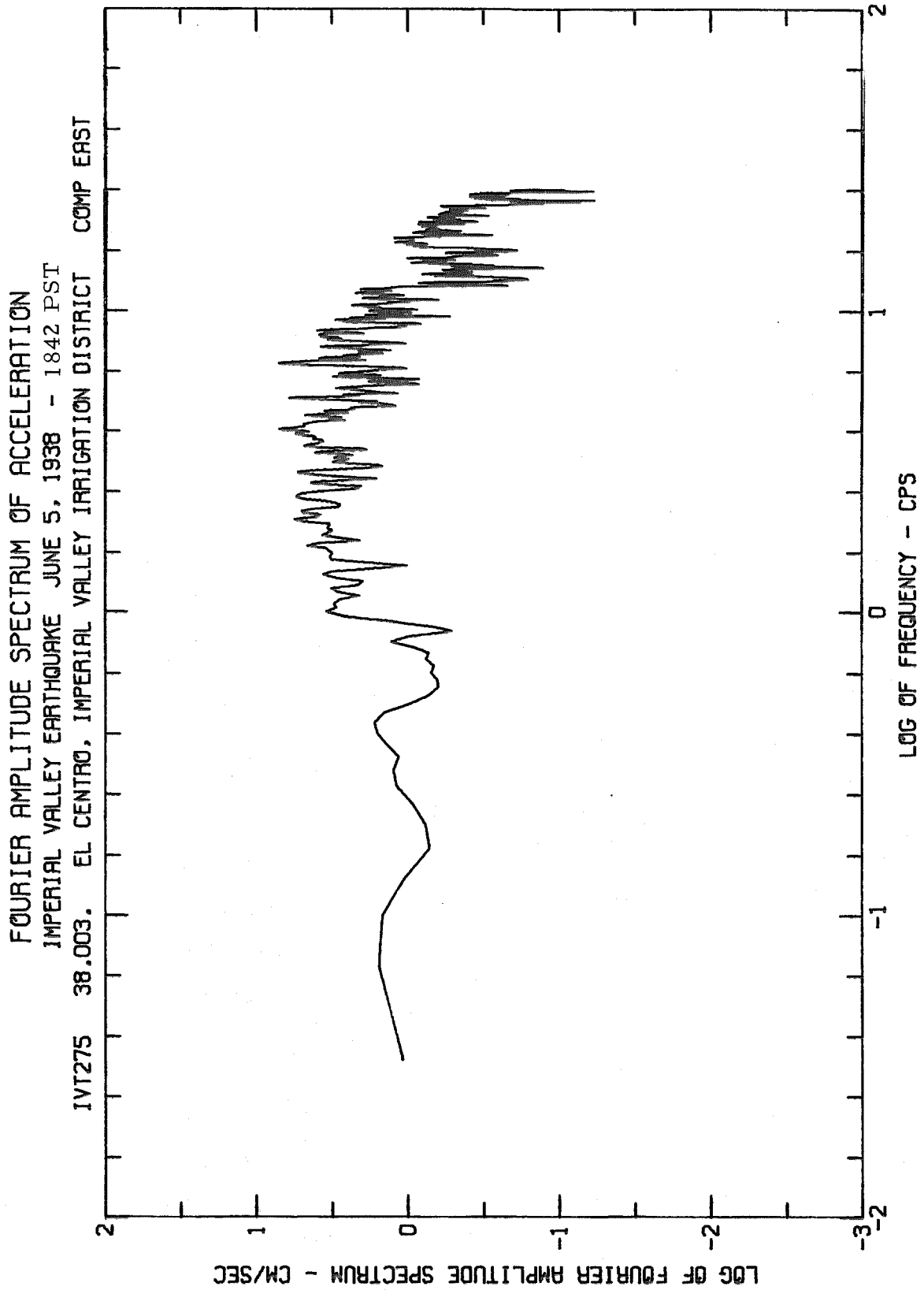
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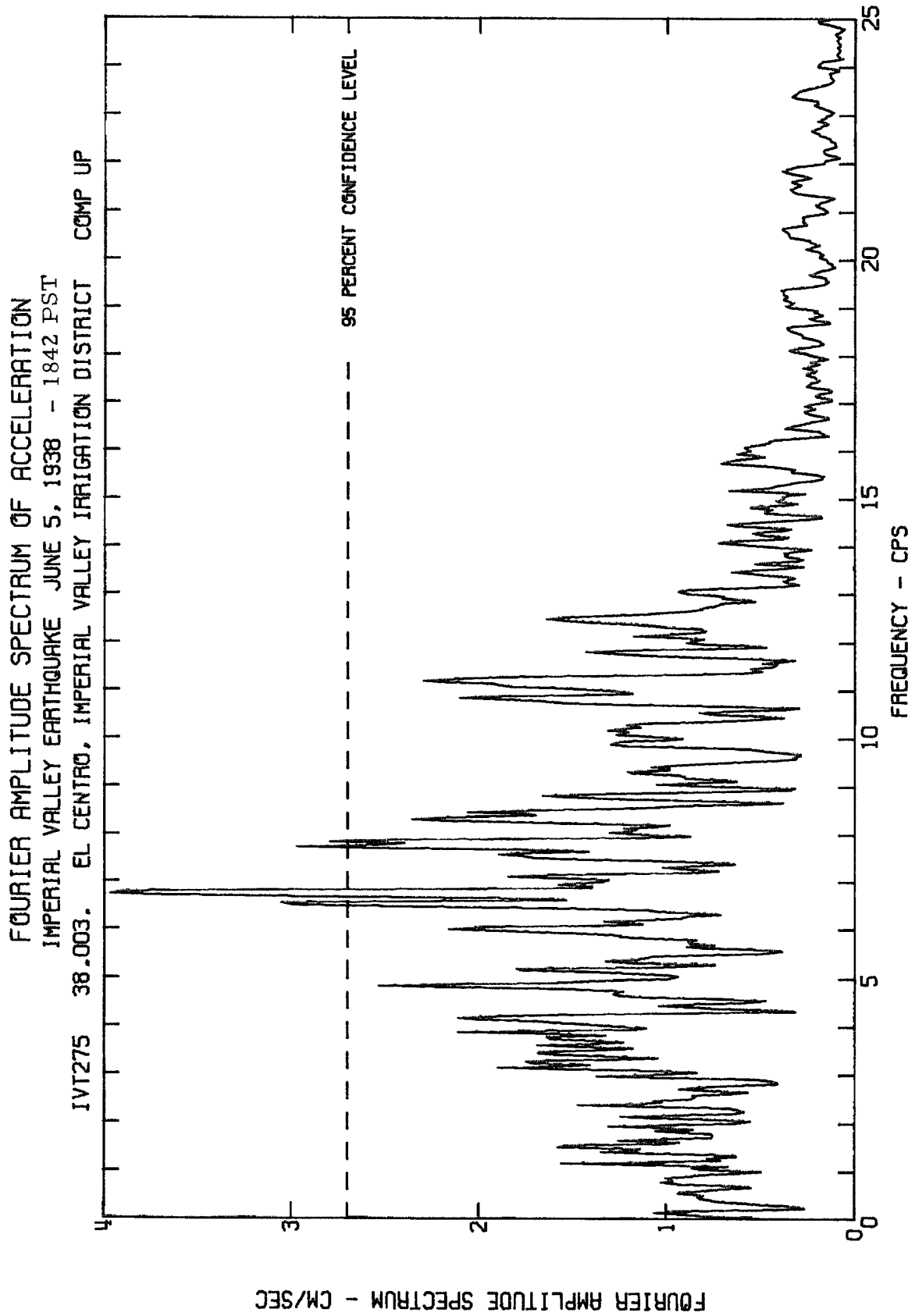




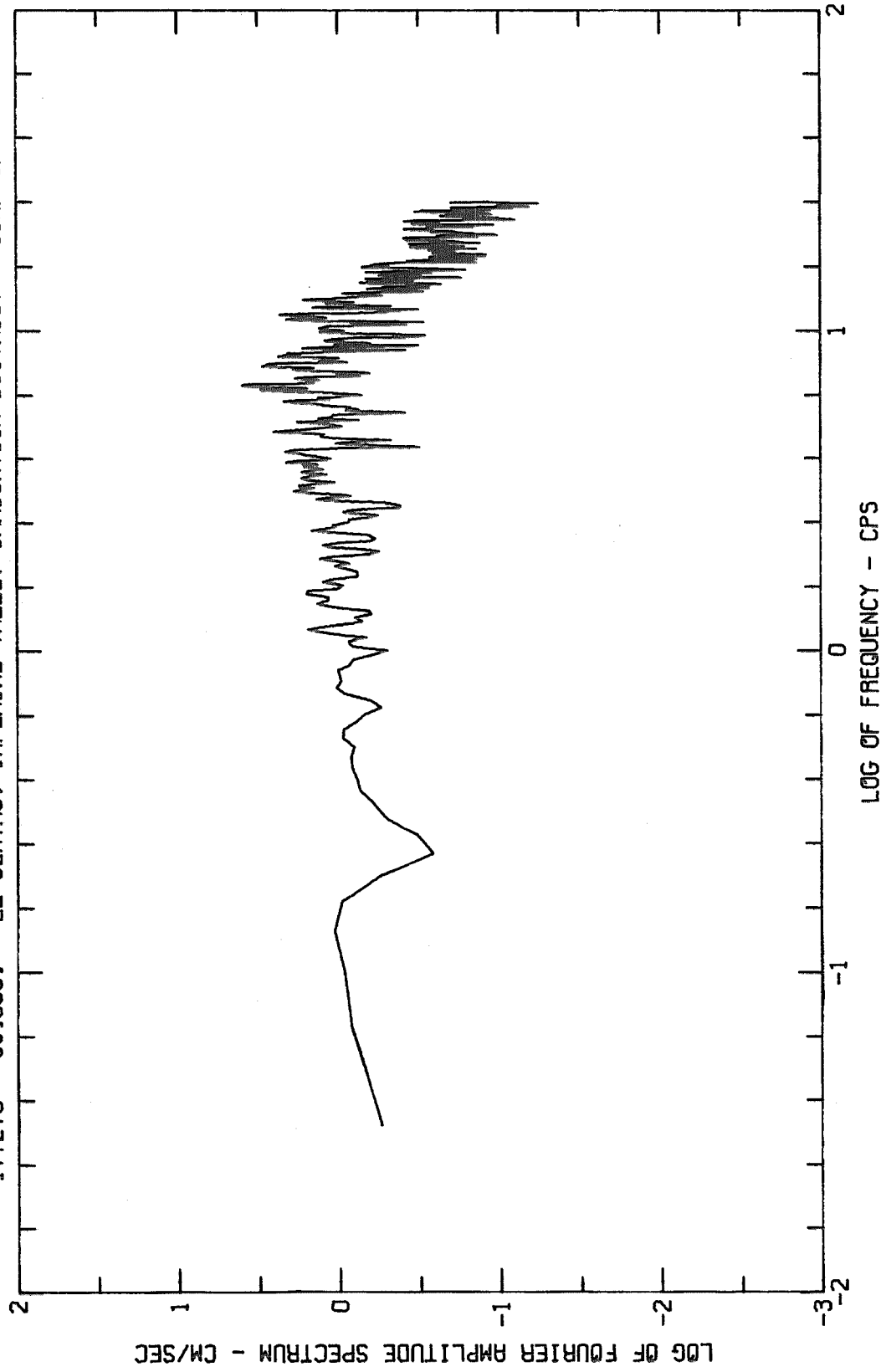


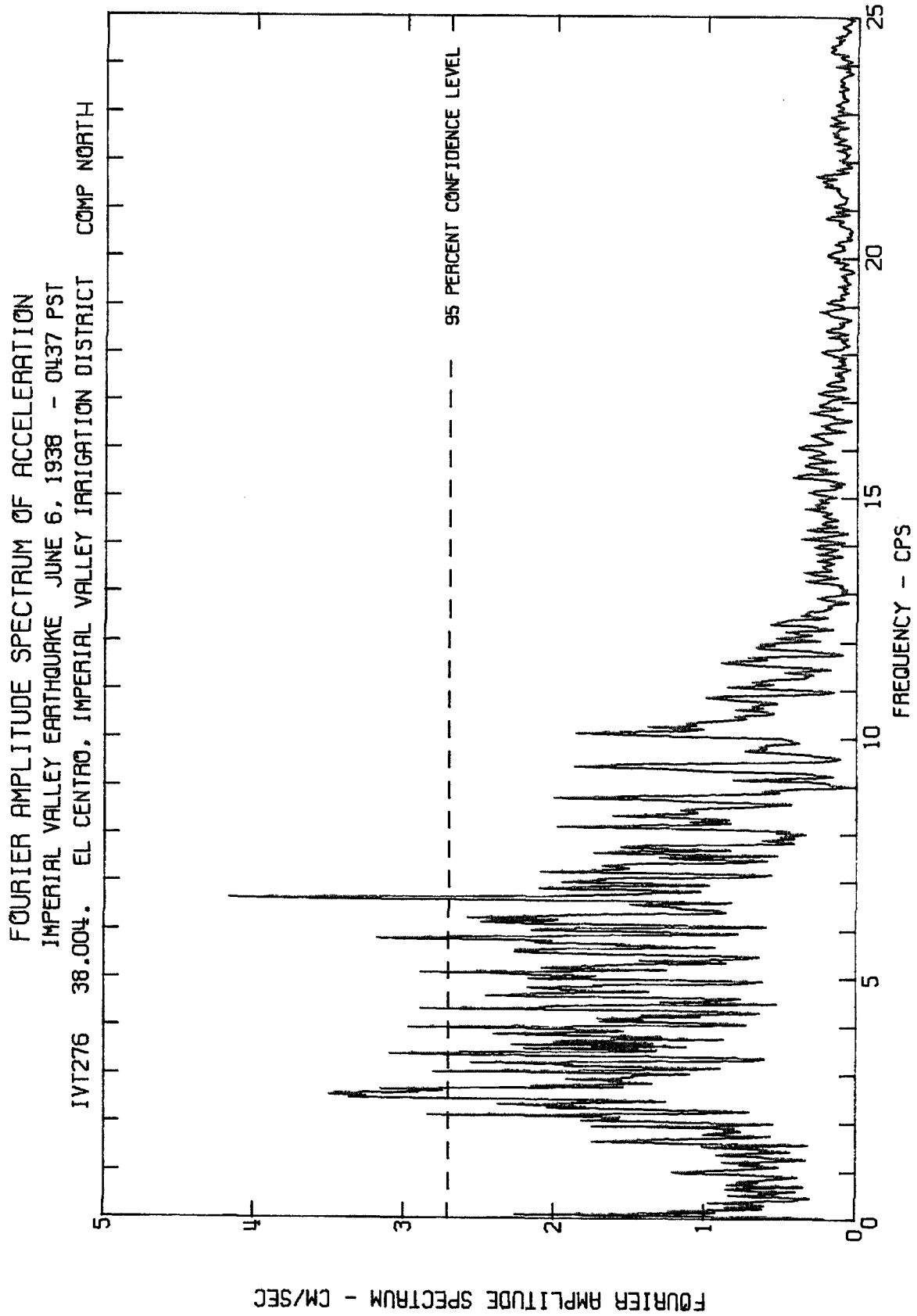






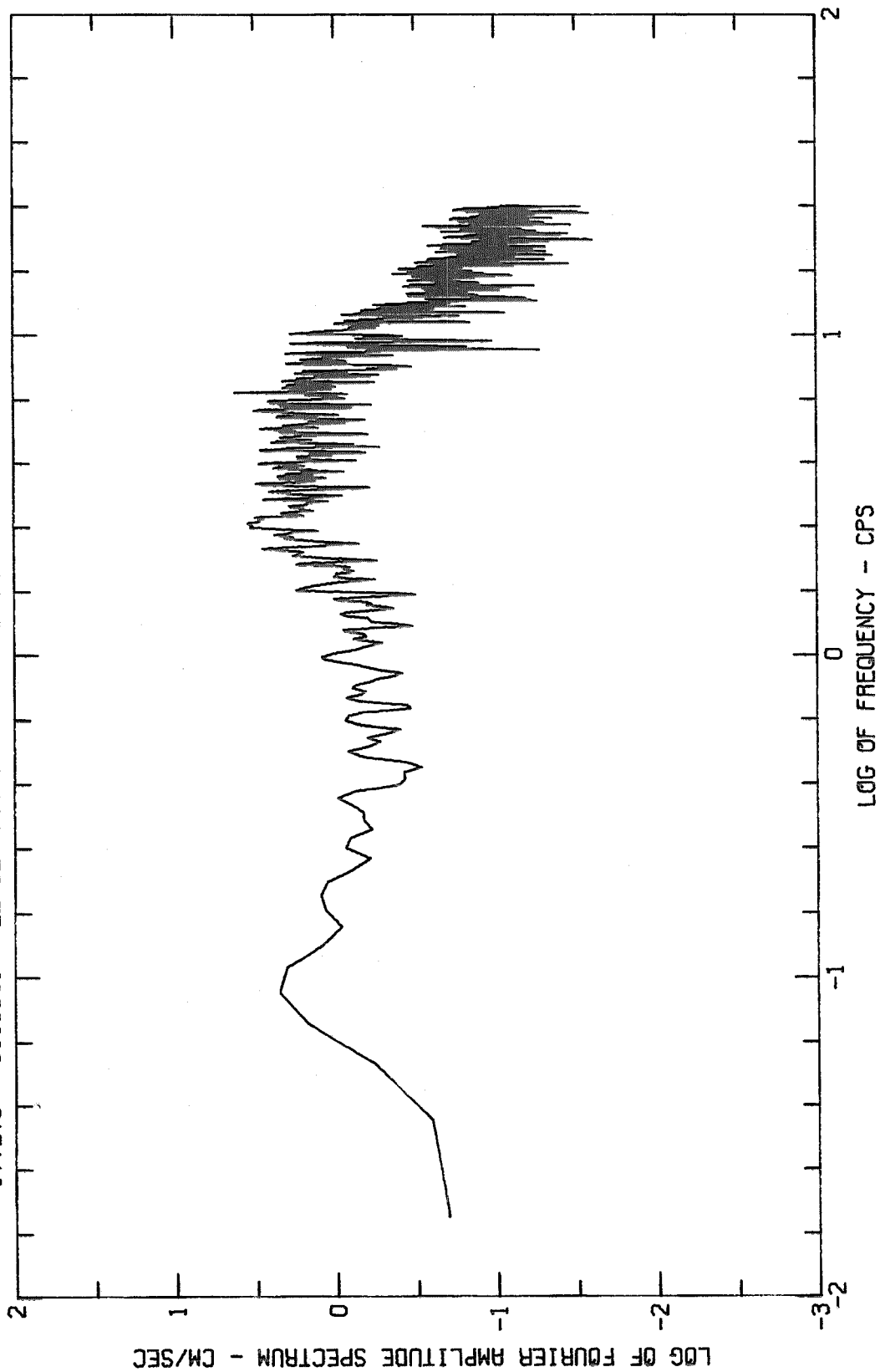
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1VT275 38.003. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP



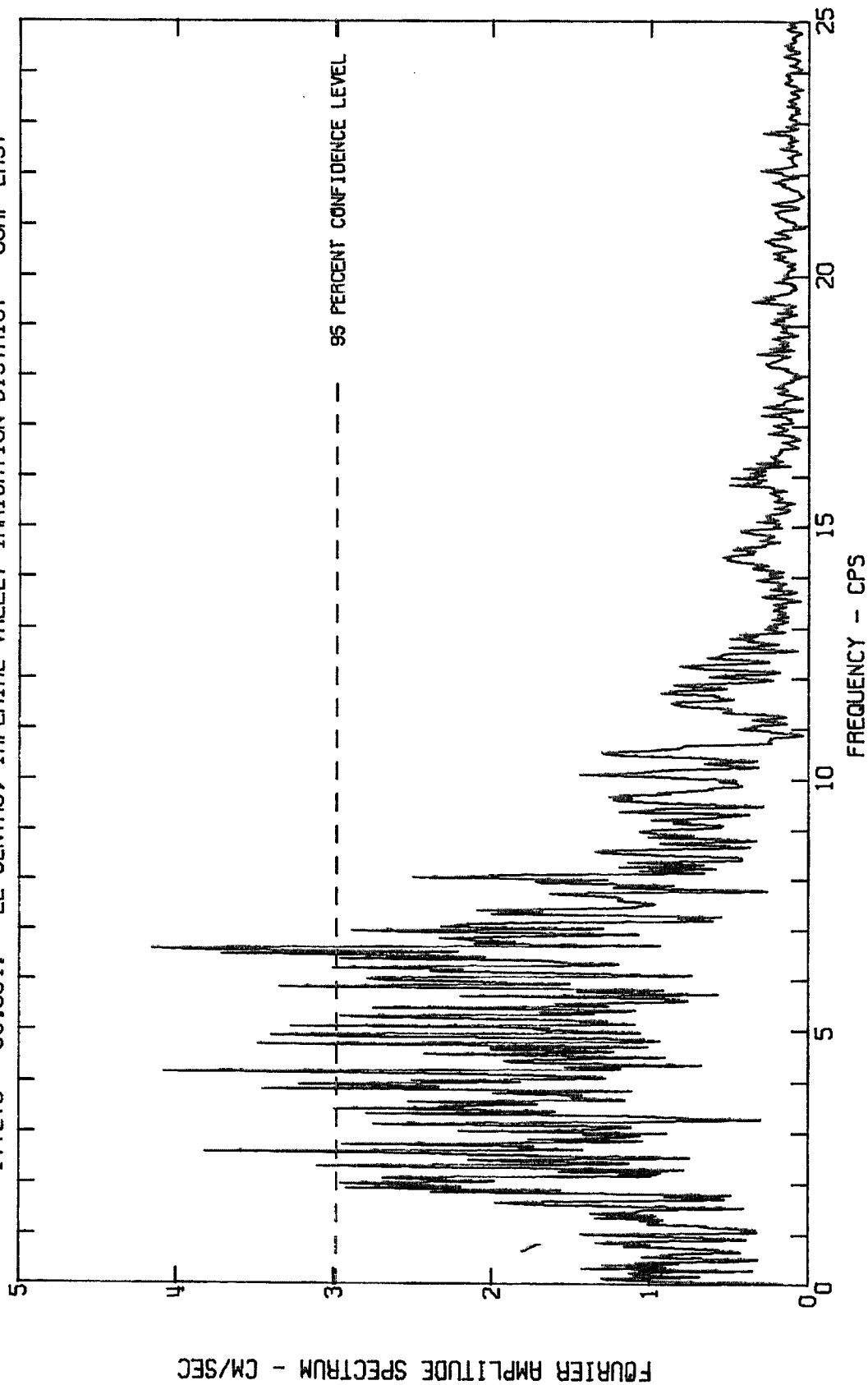




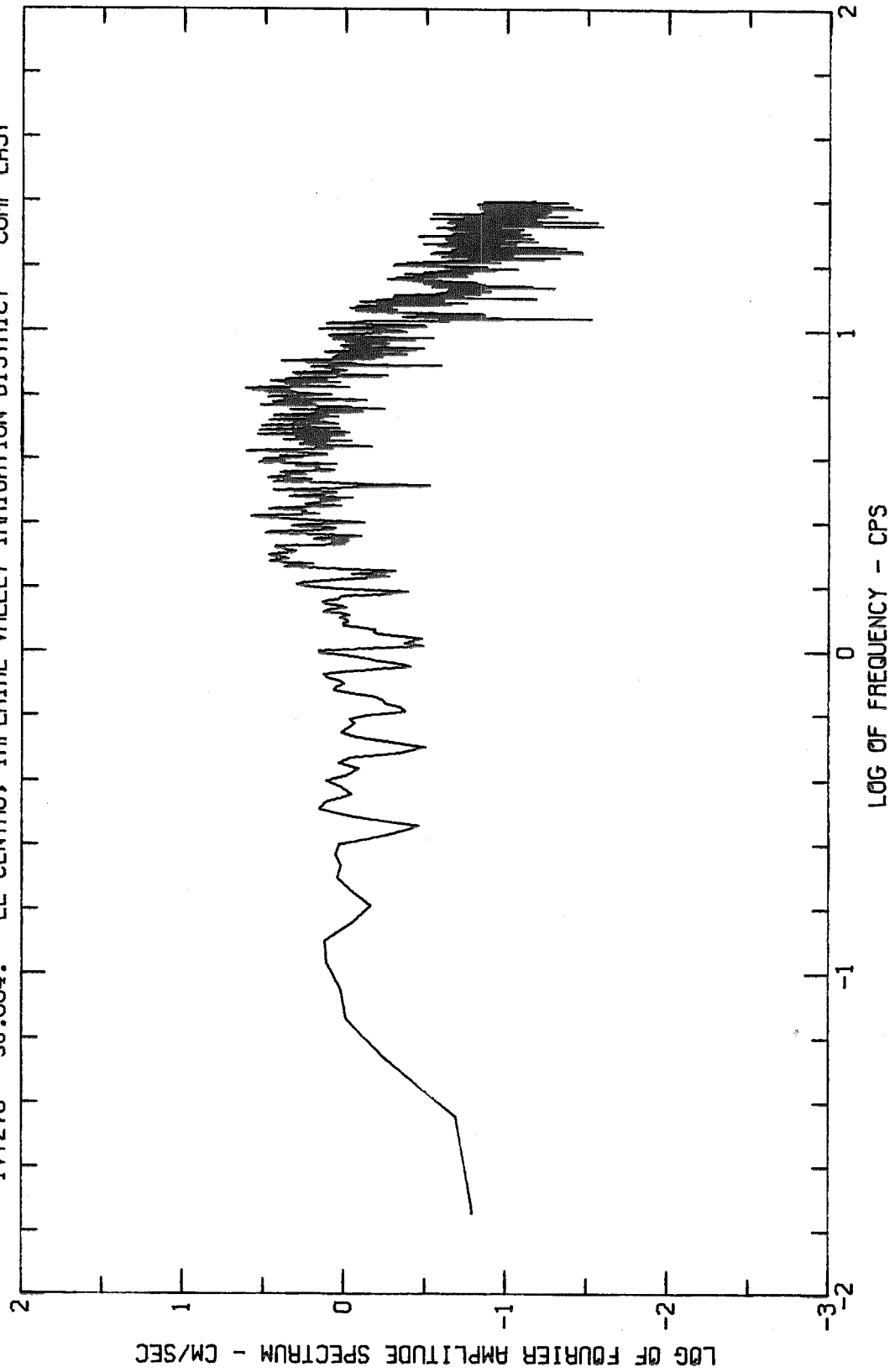
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1VT276 38.004. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH

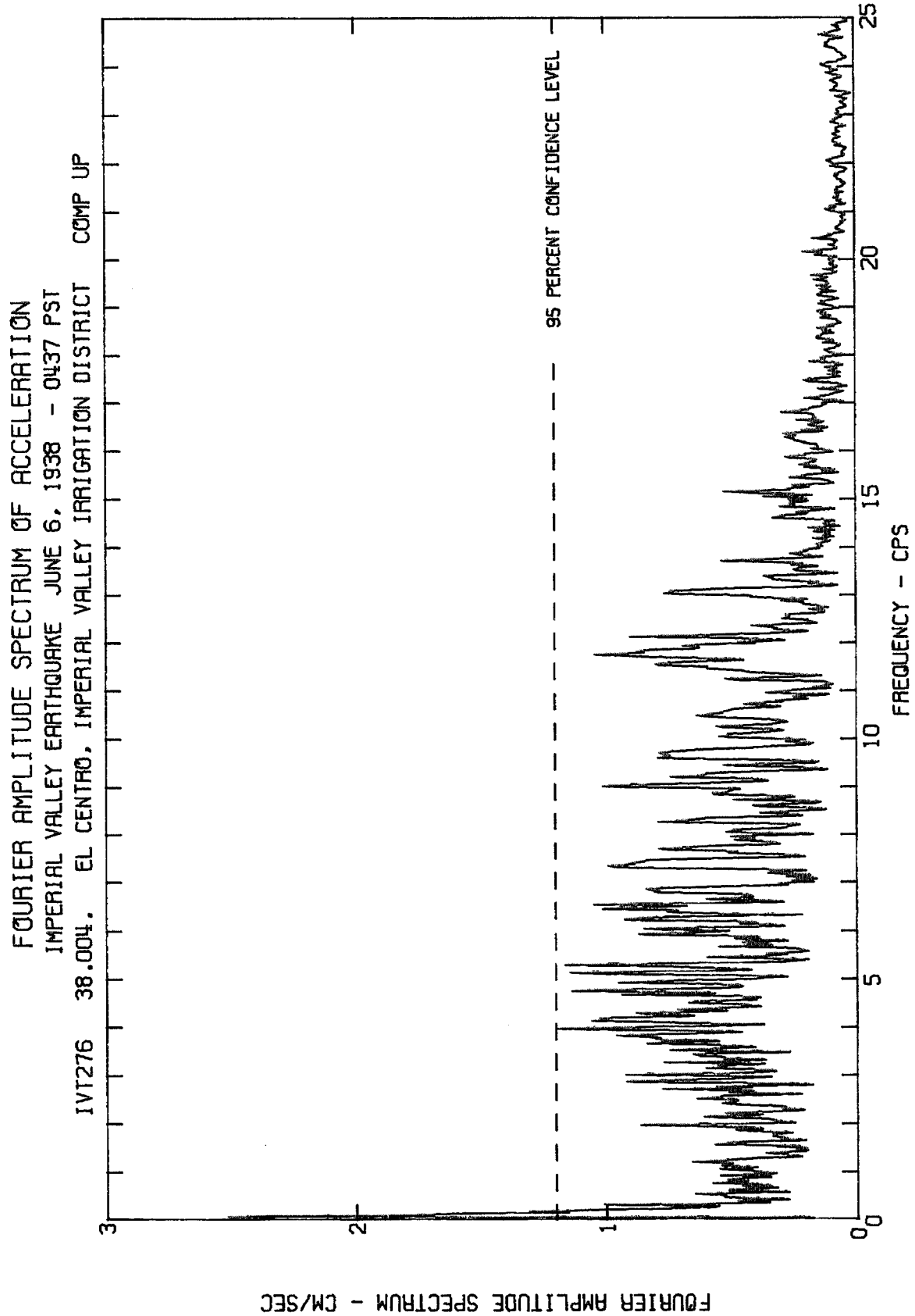


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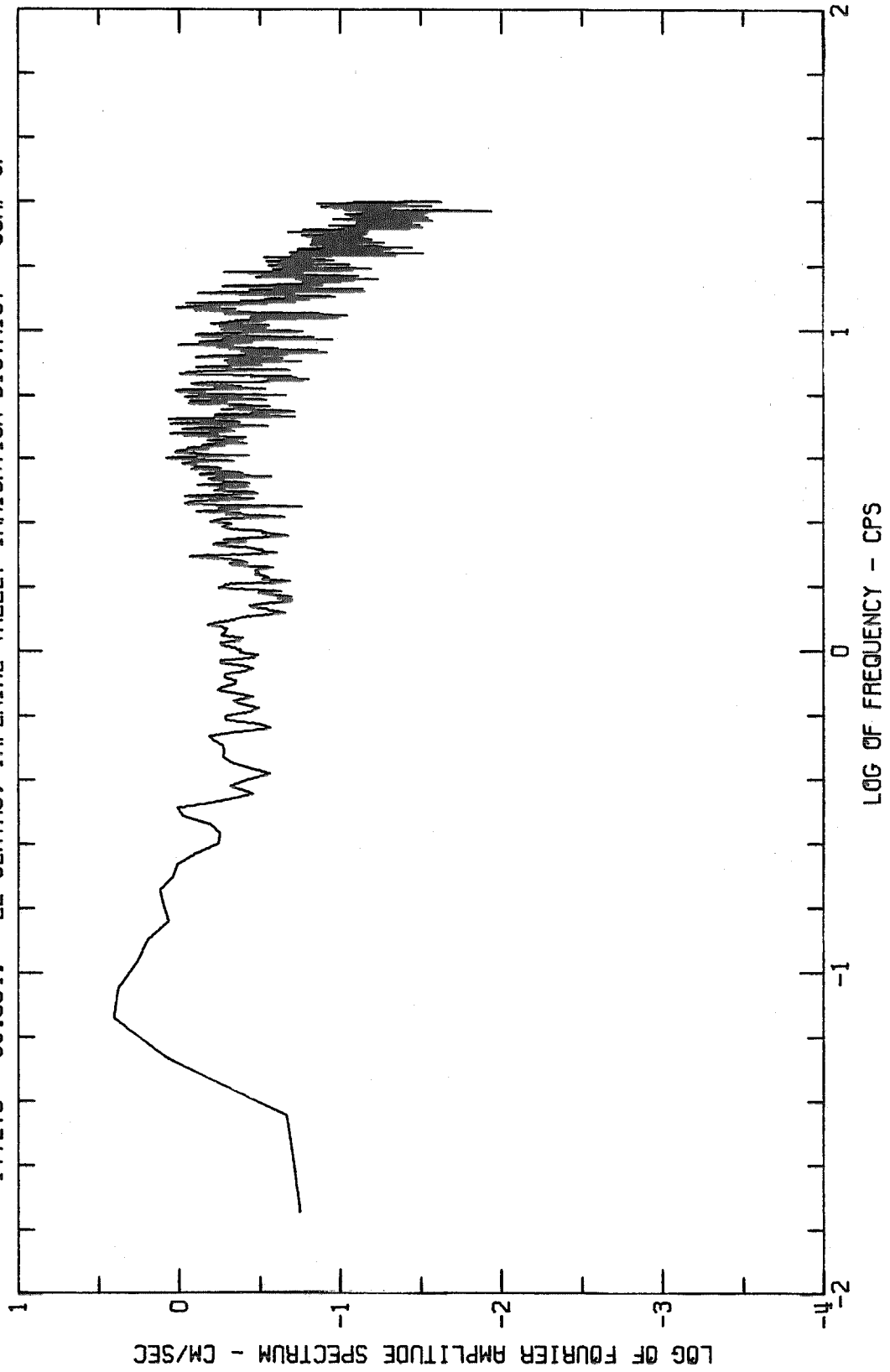


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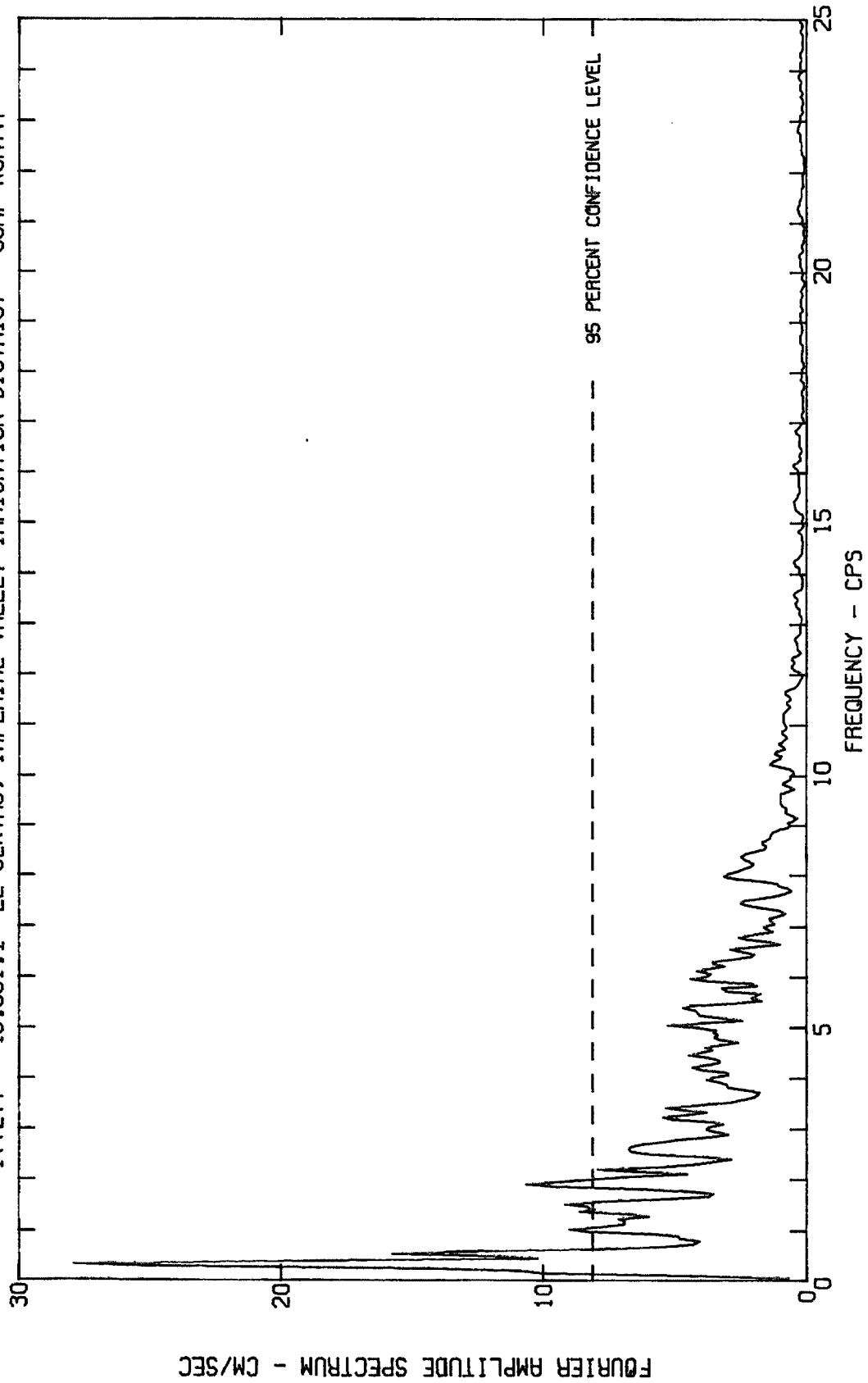




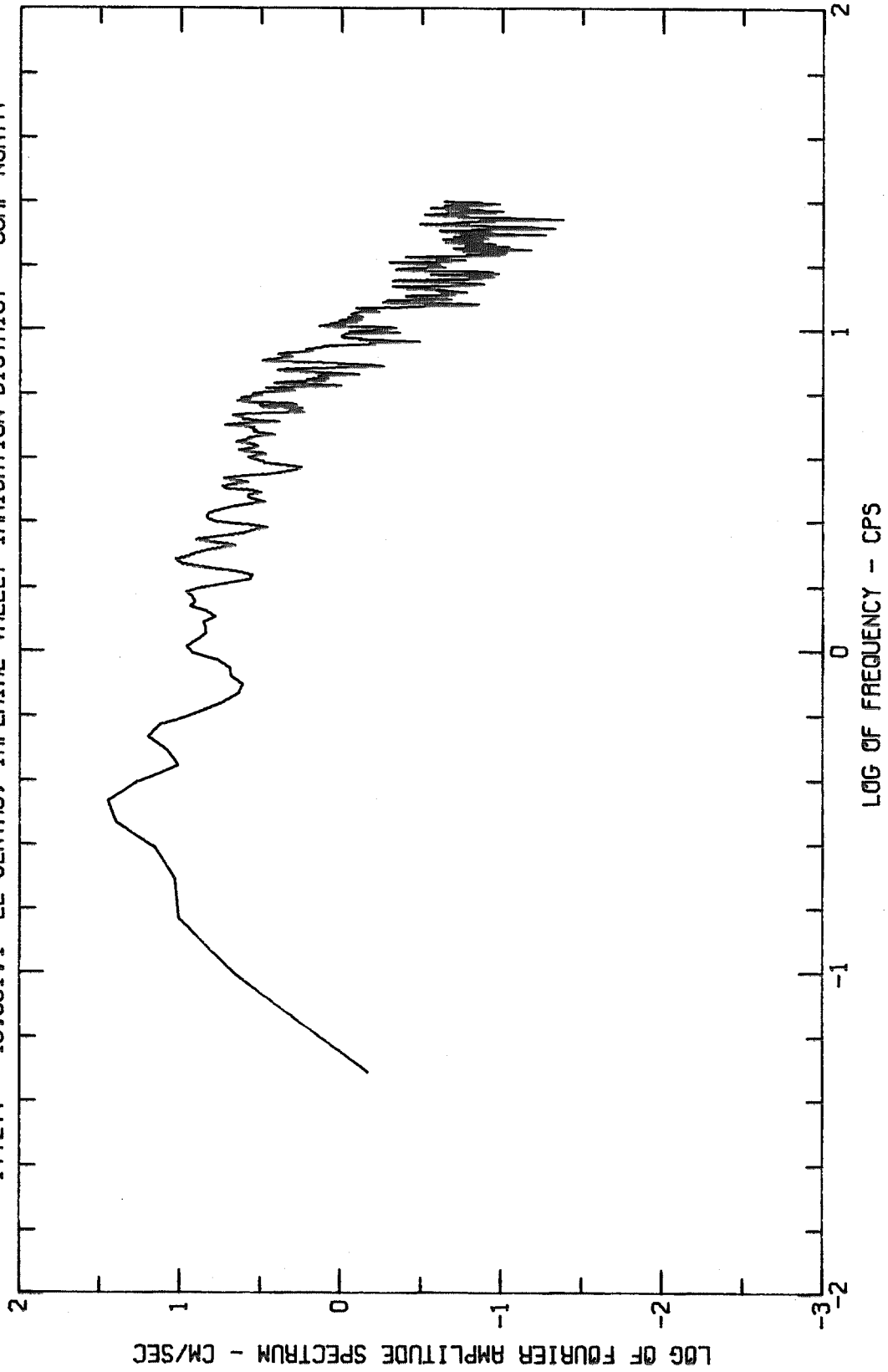
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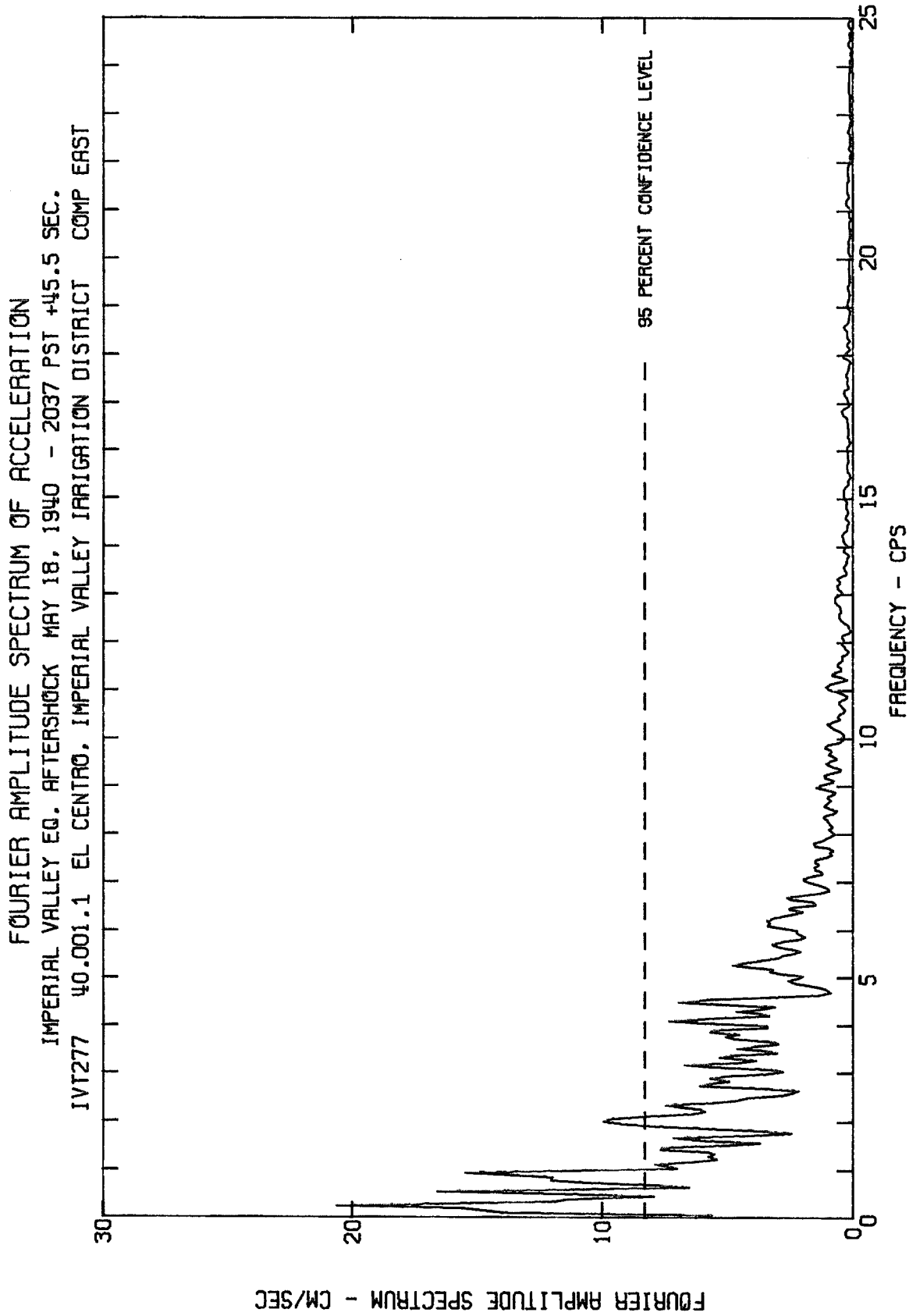


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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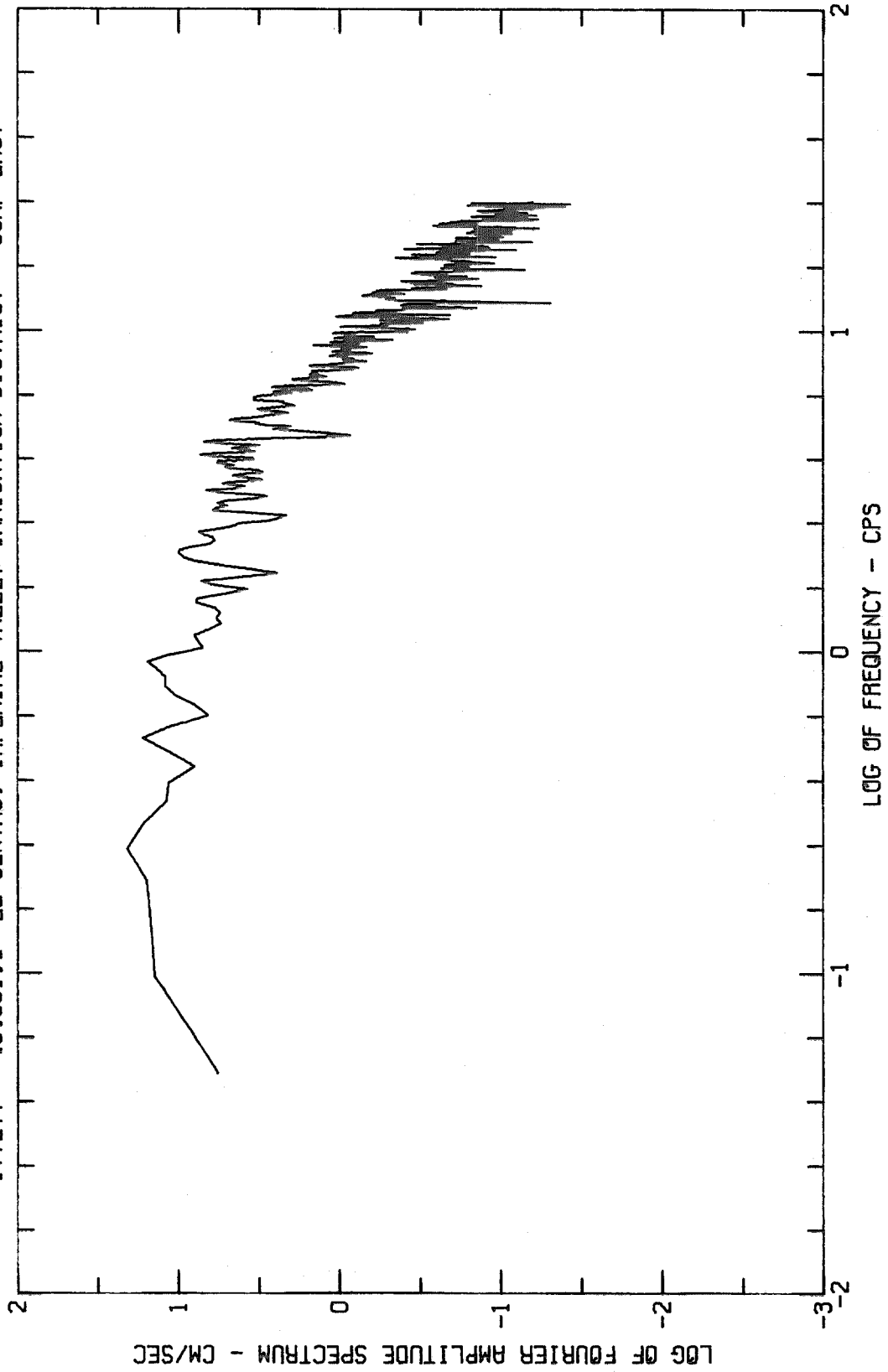
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IVT277 40.001.1 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH

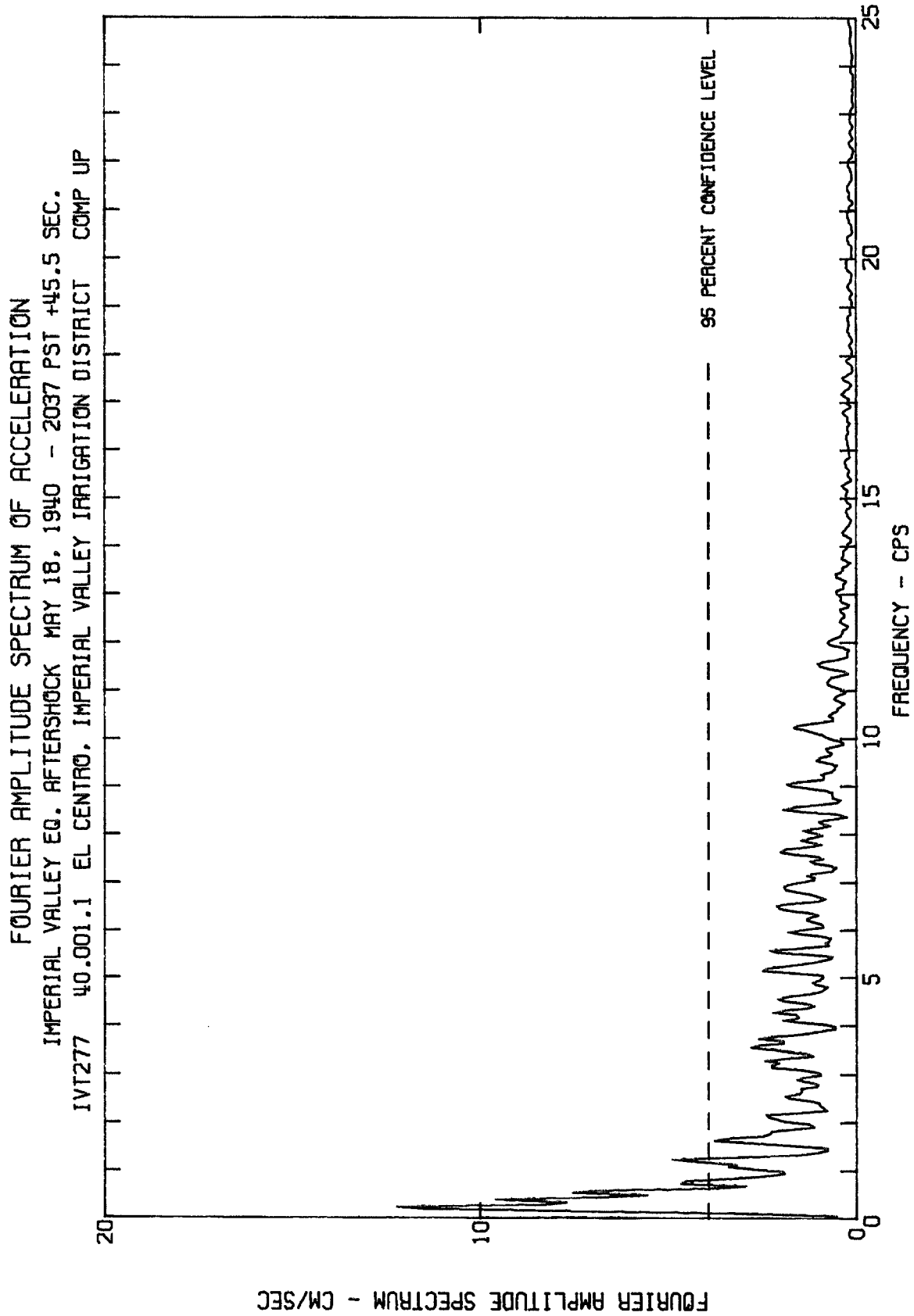




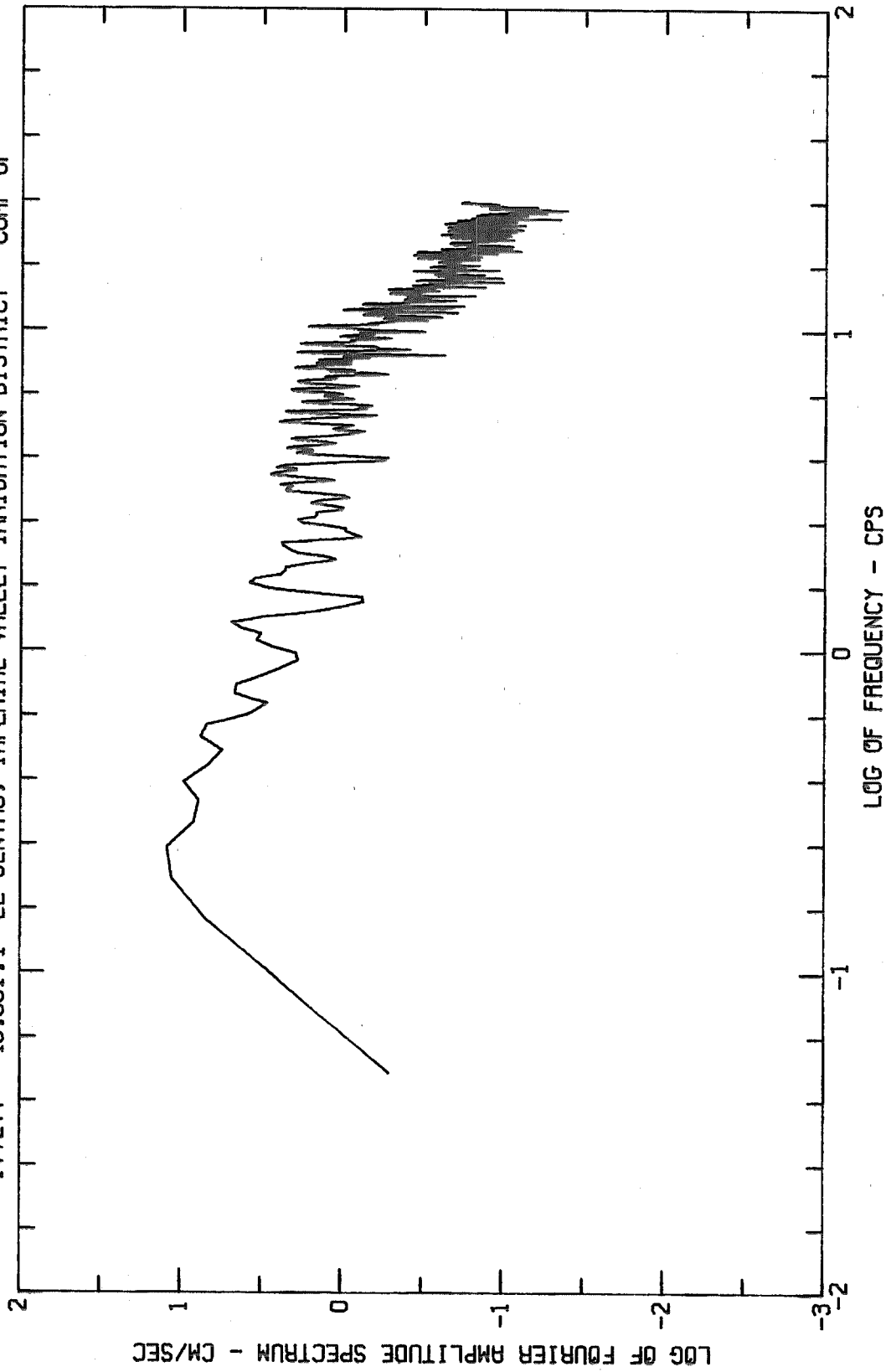


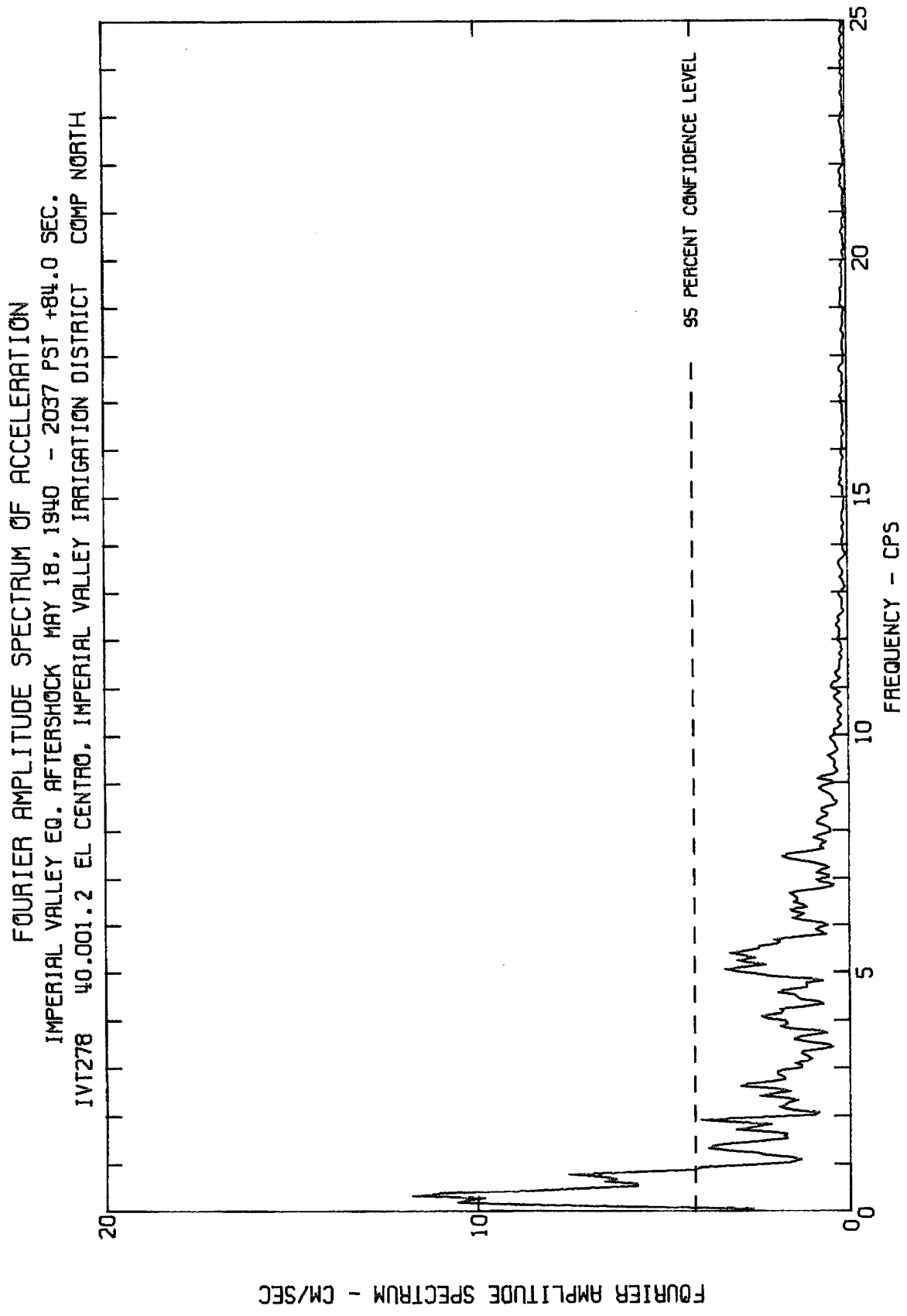
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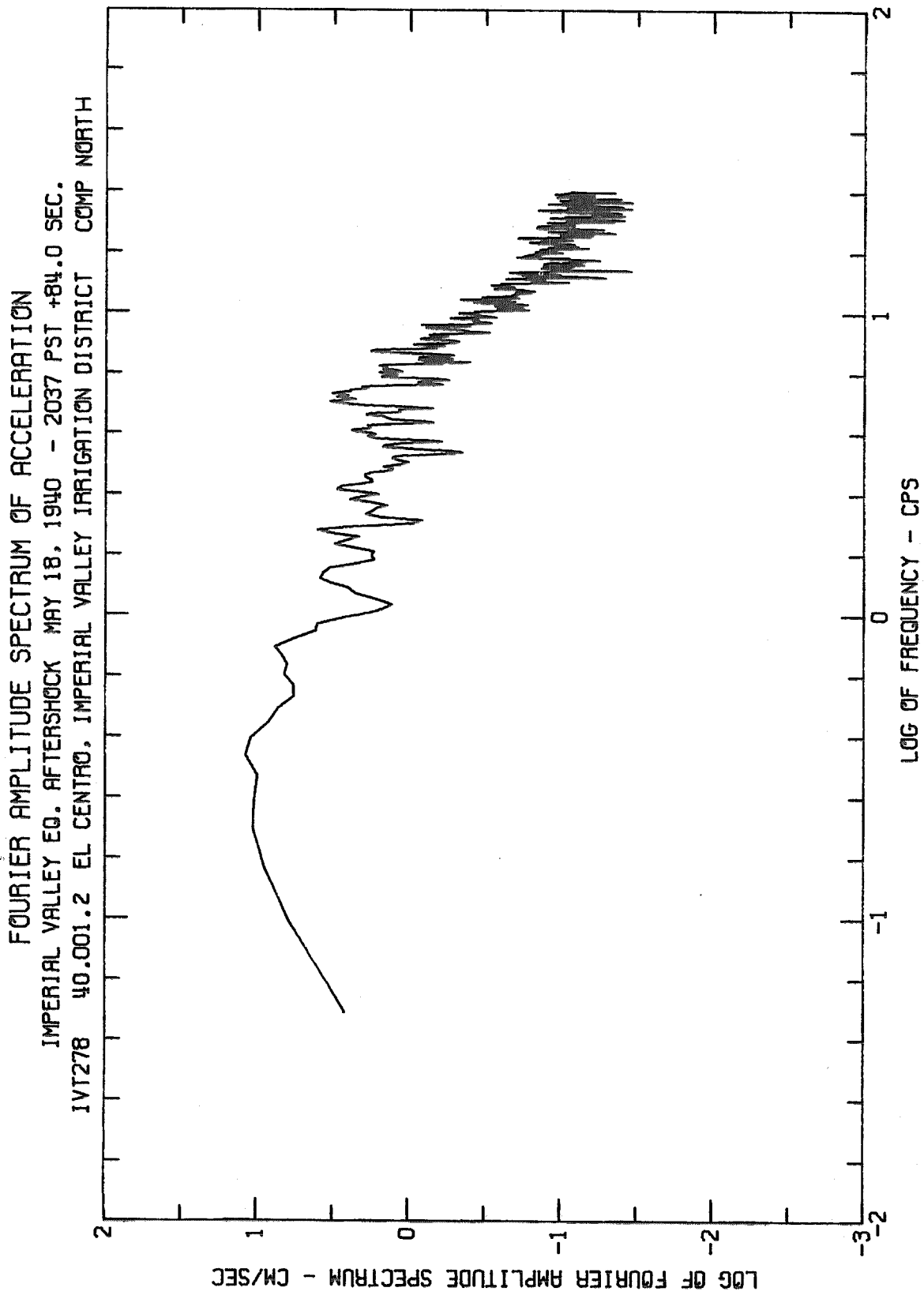


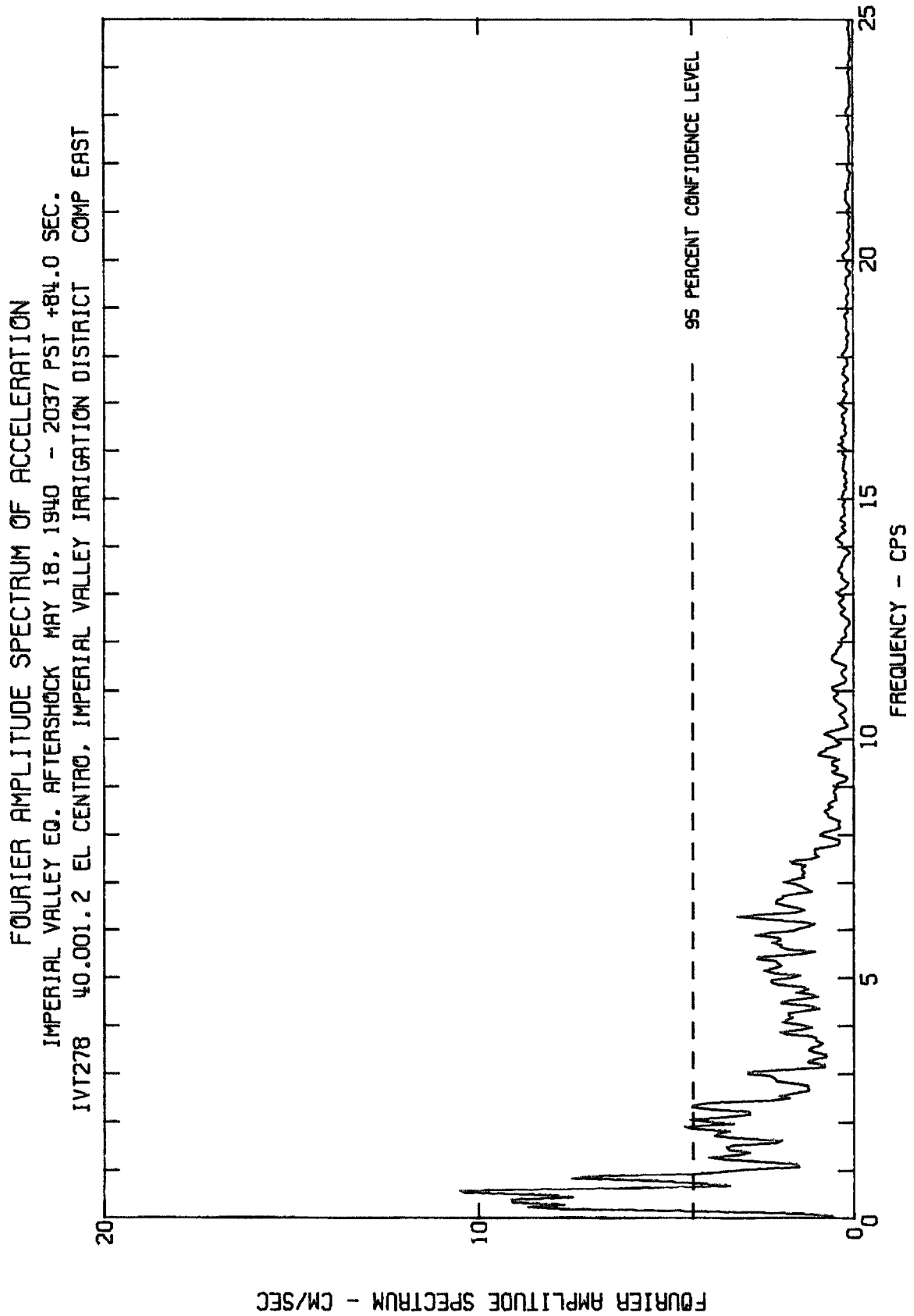


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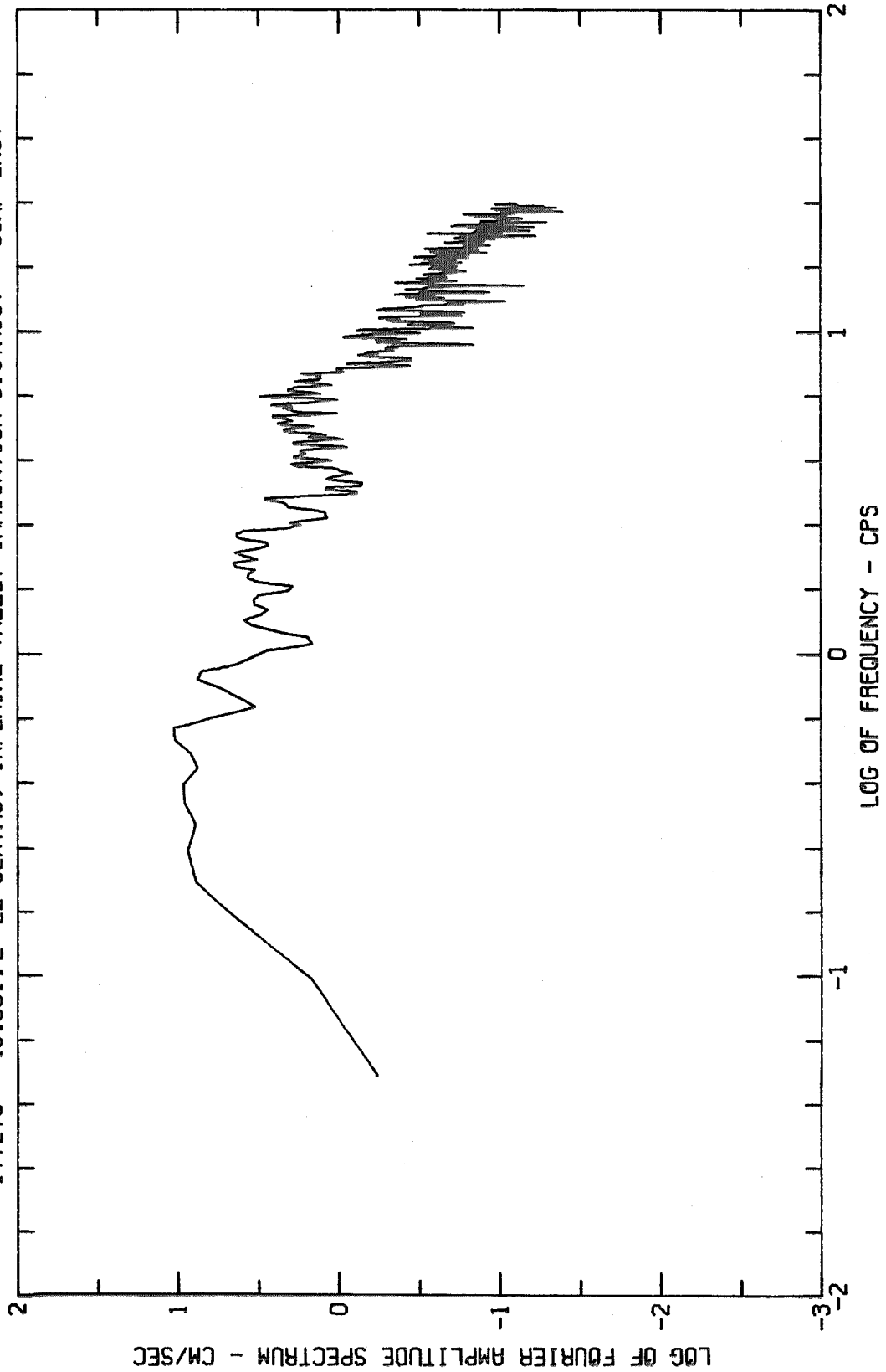


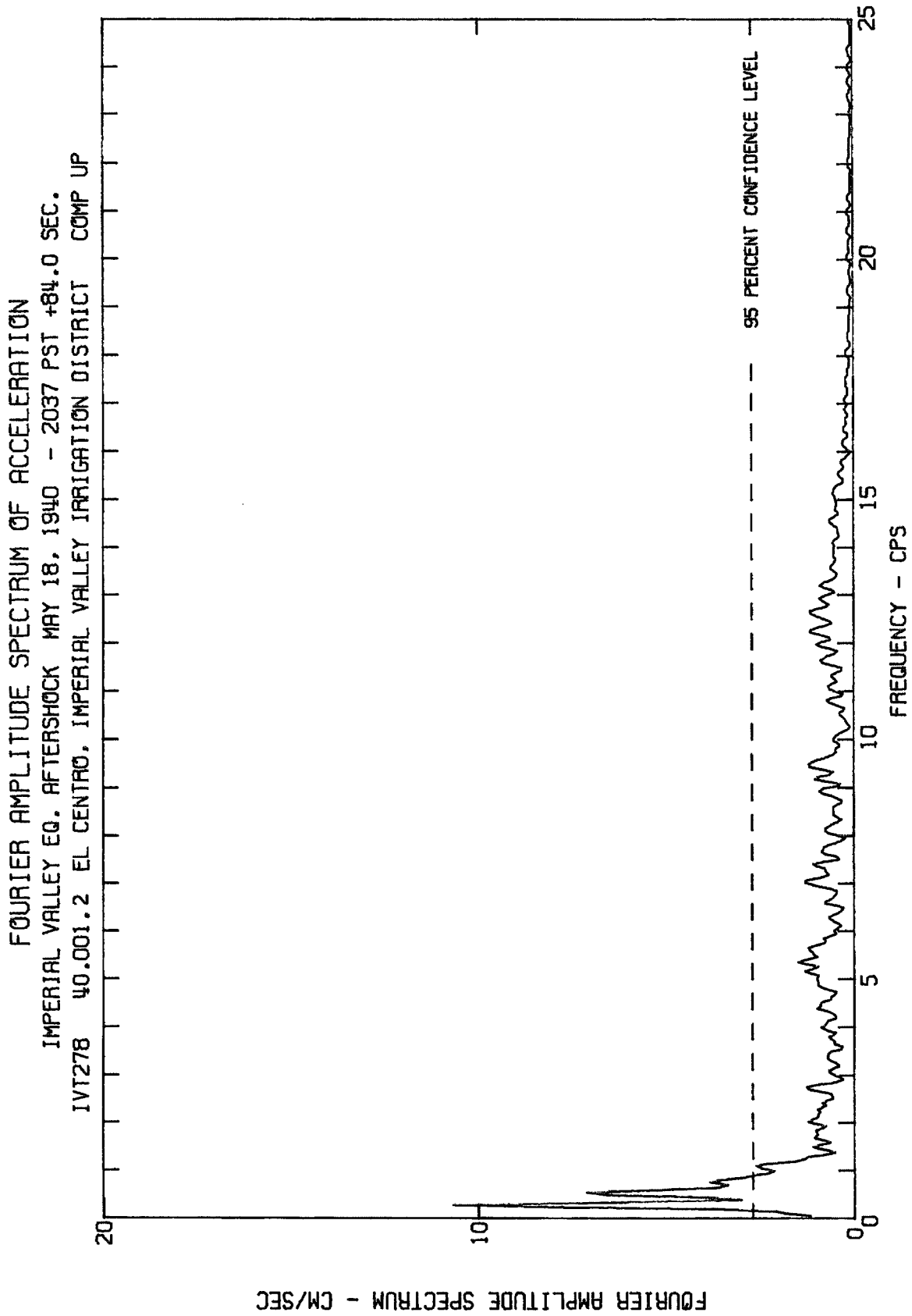






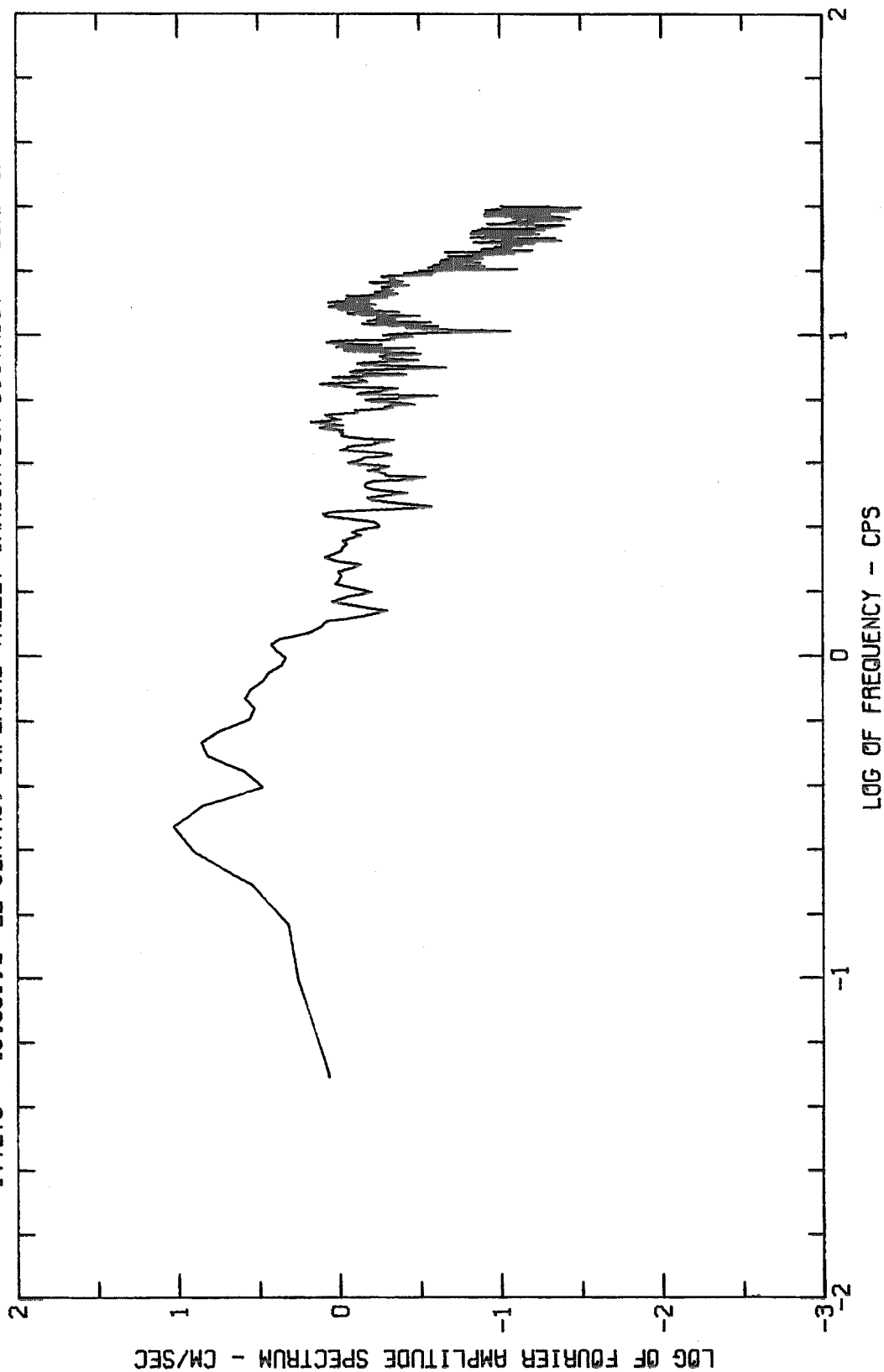
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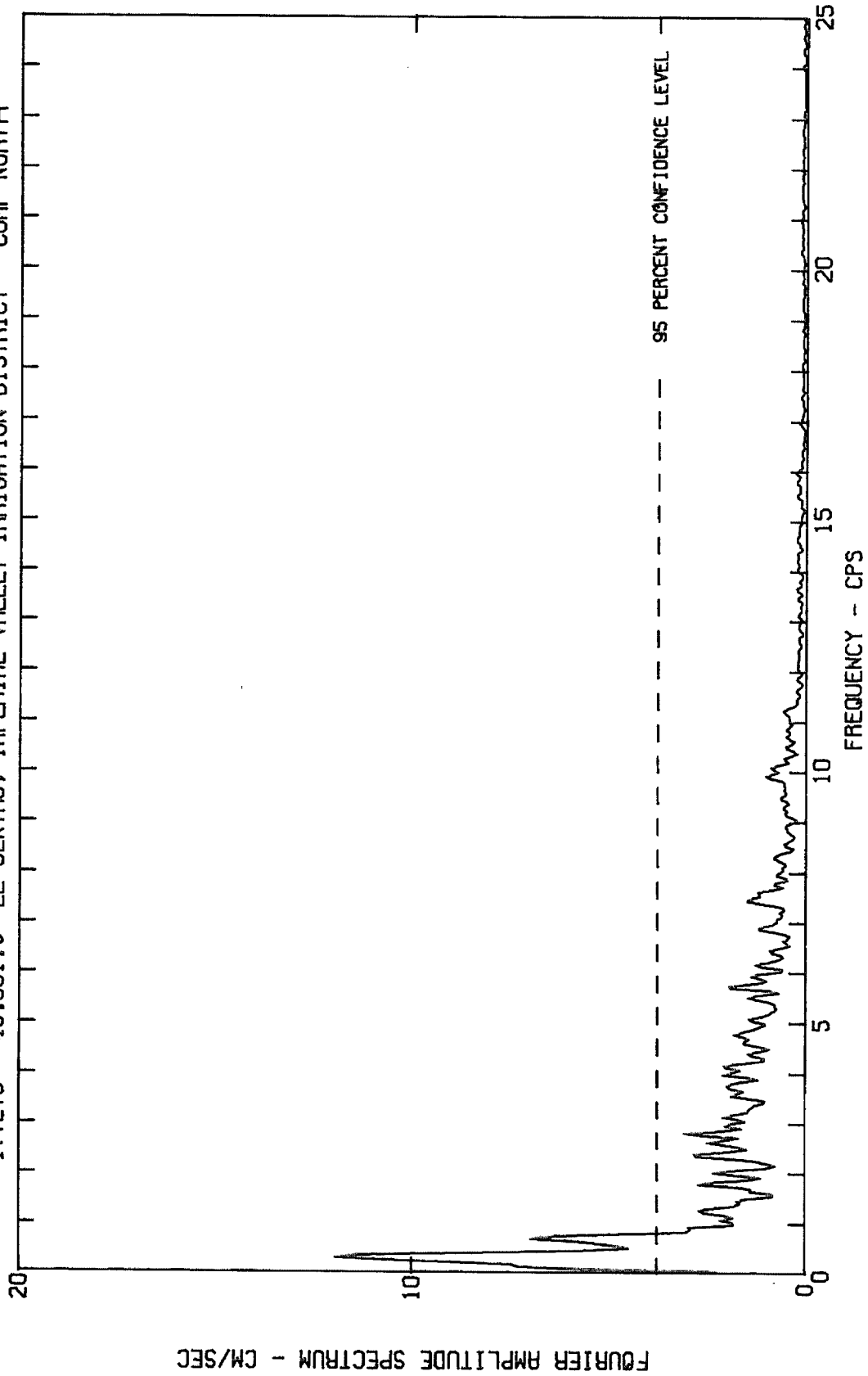




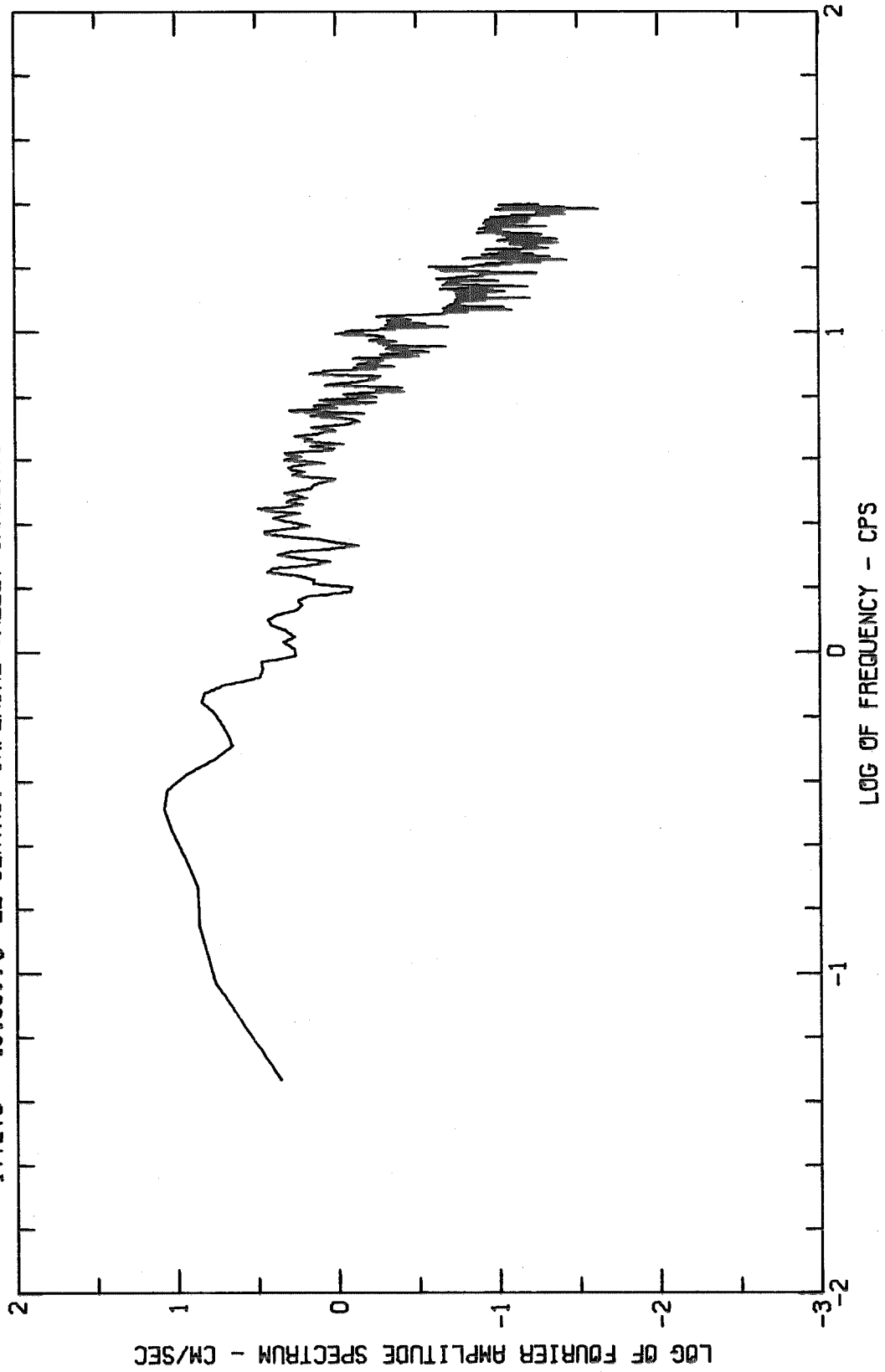
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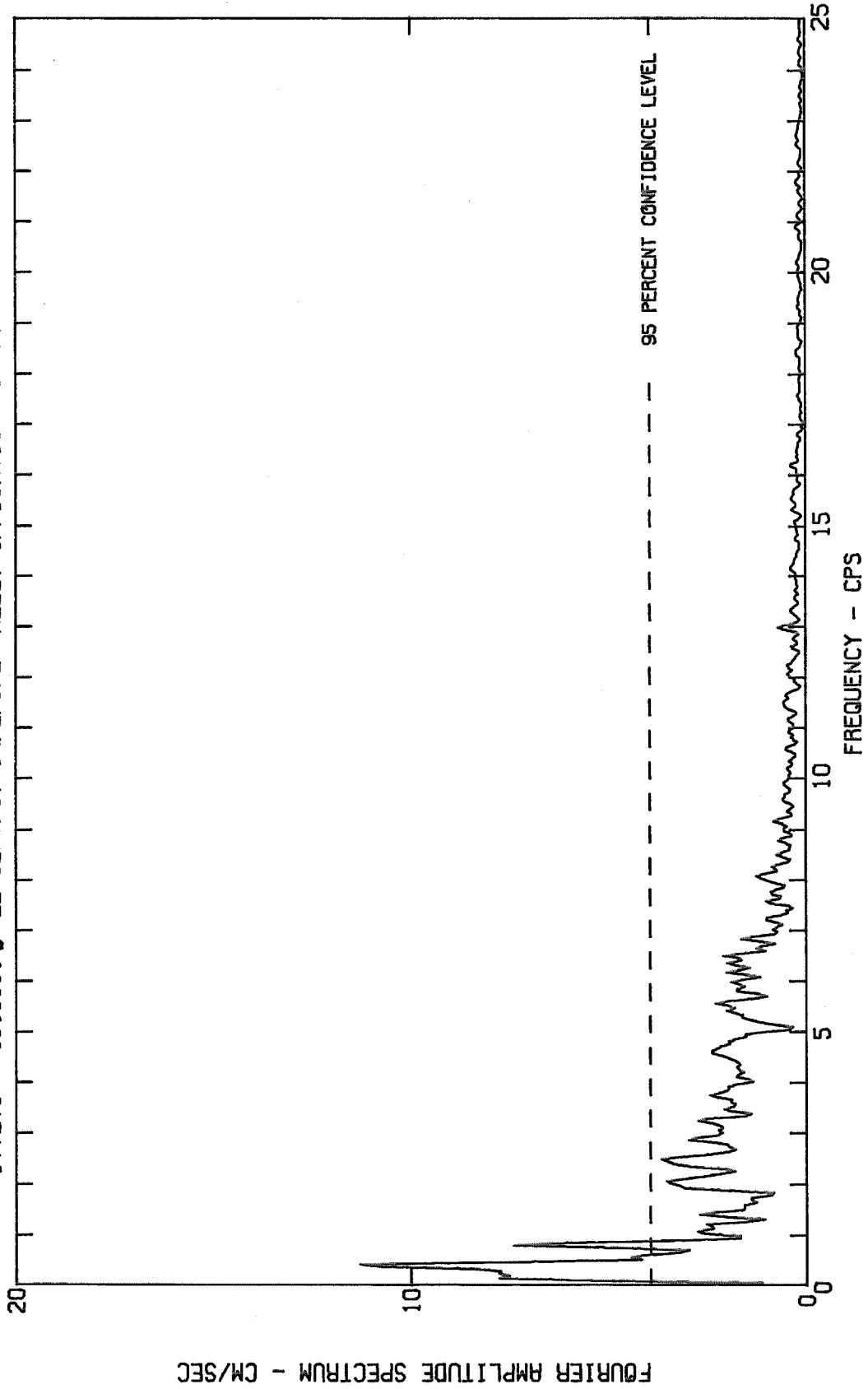
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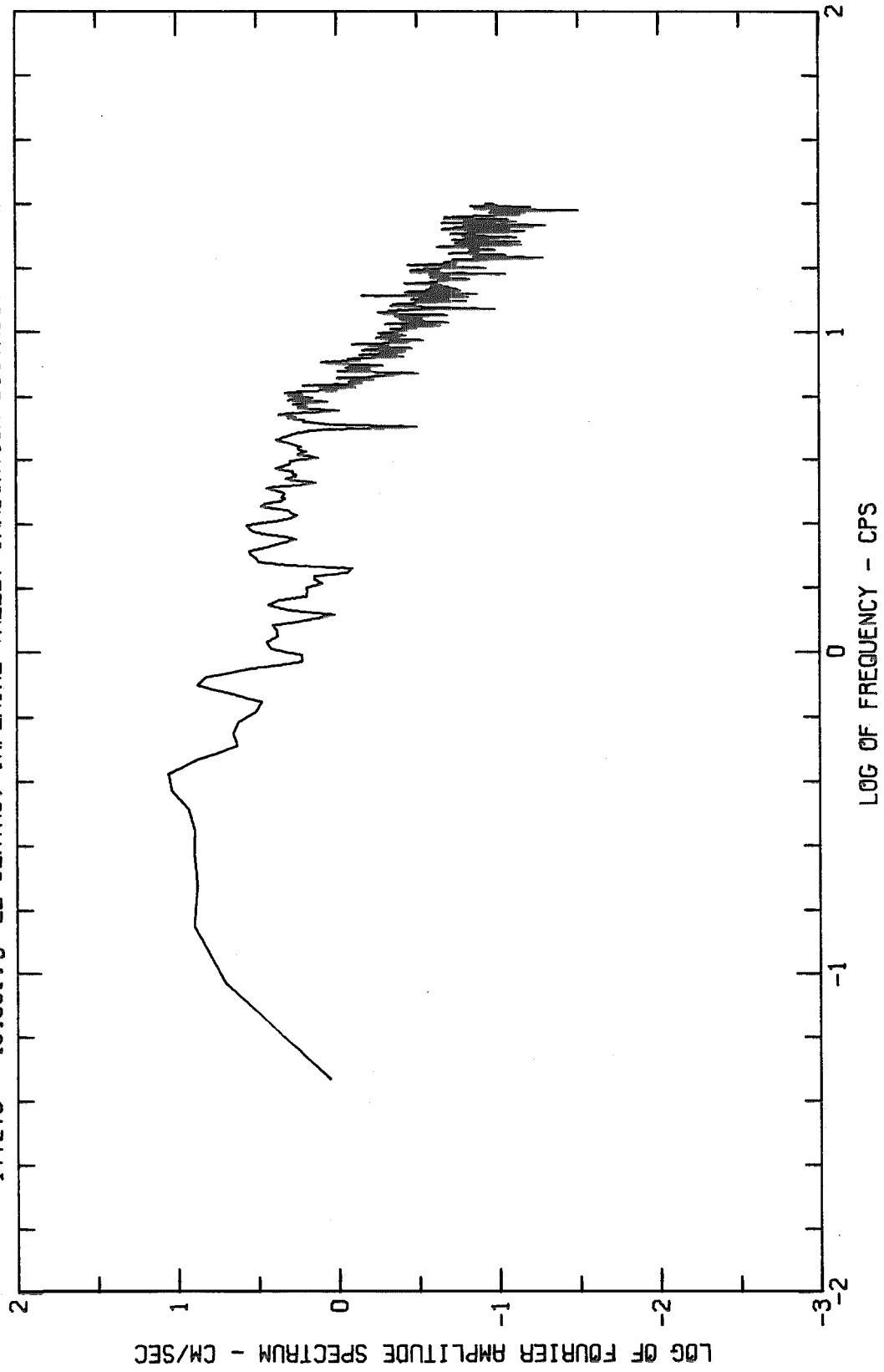
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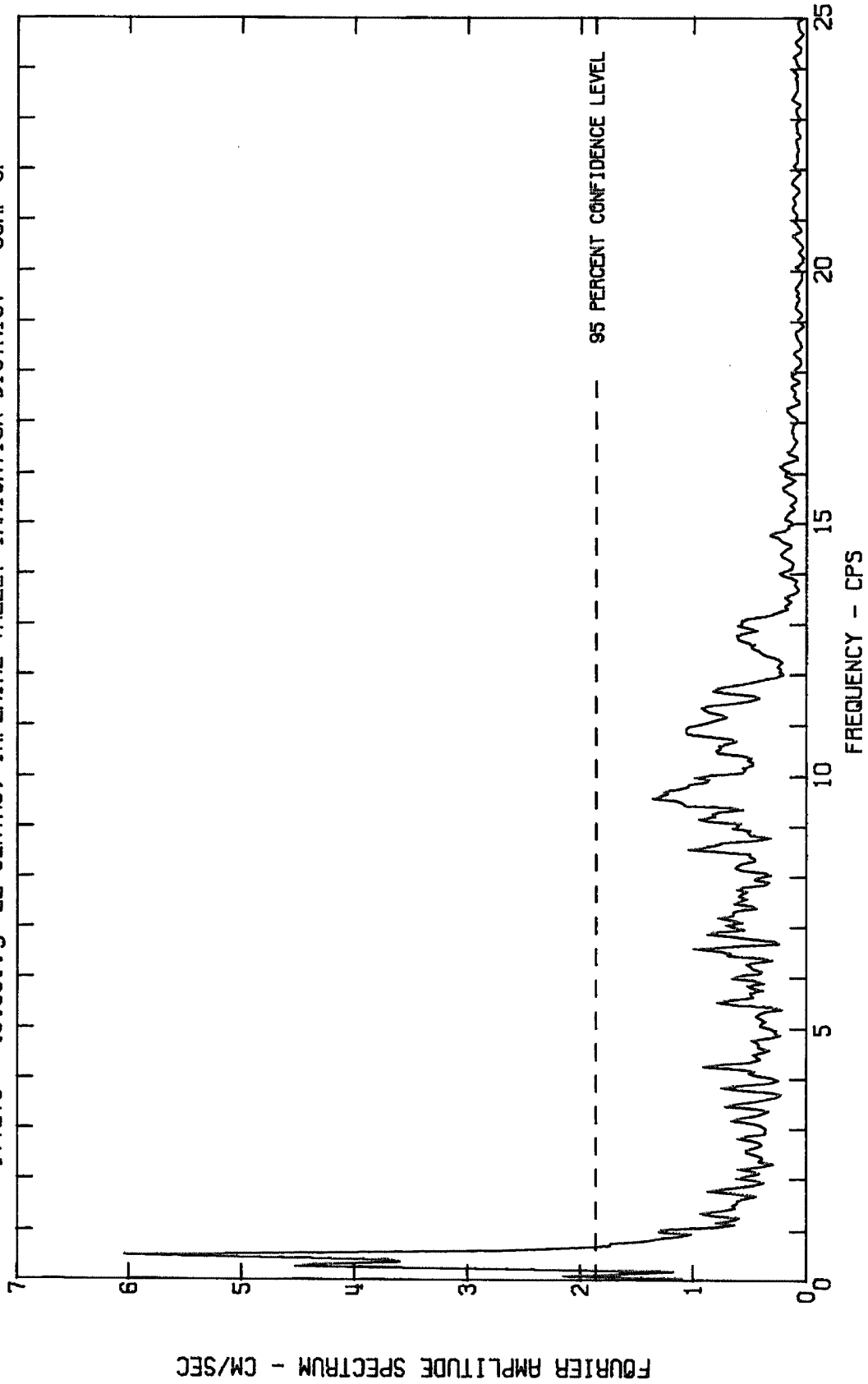
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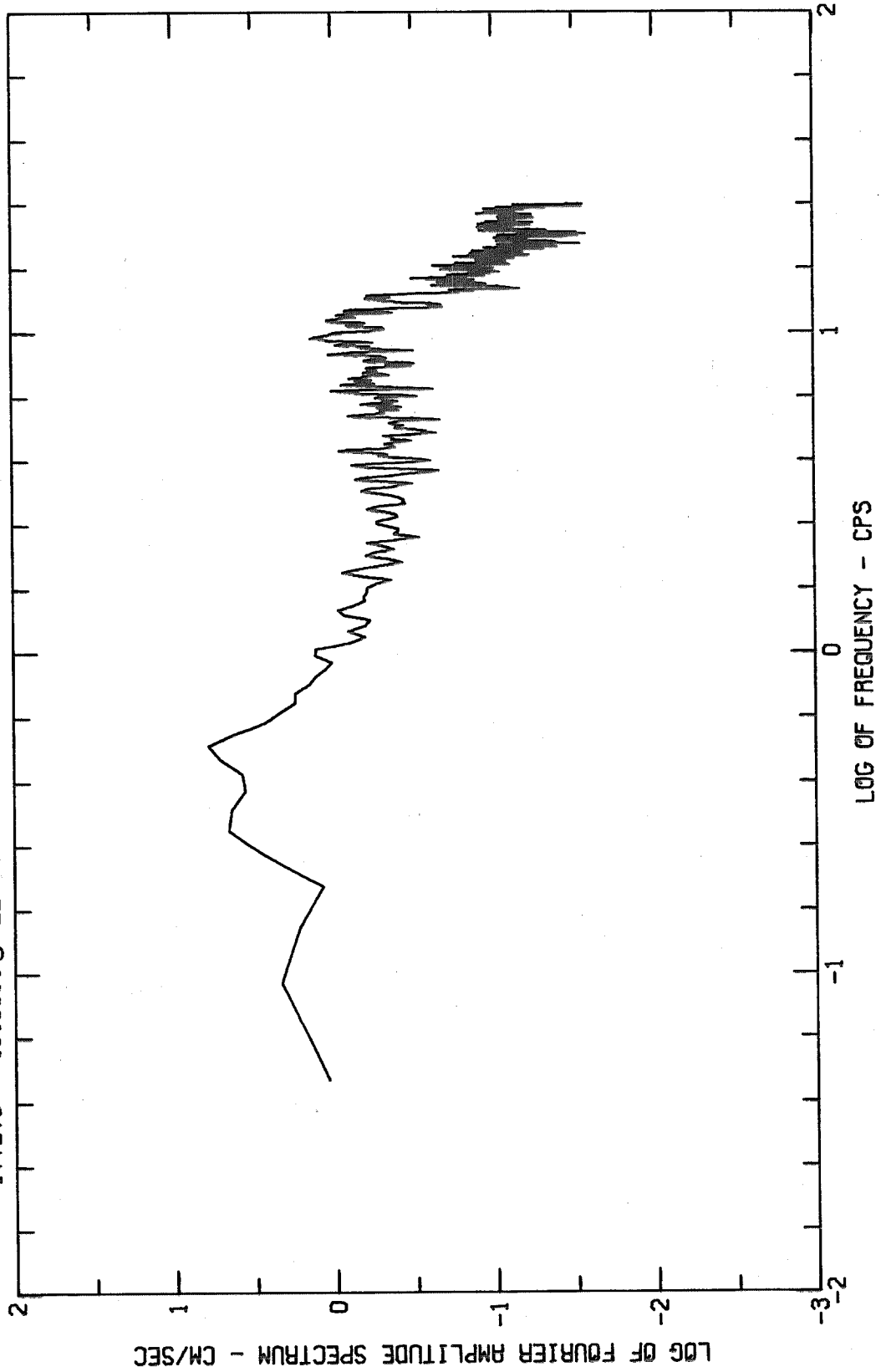
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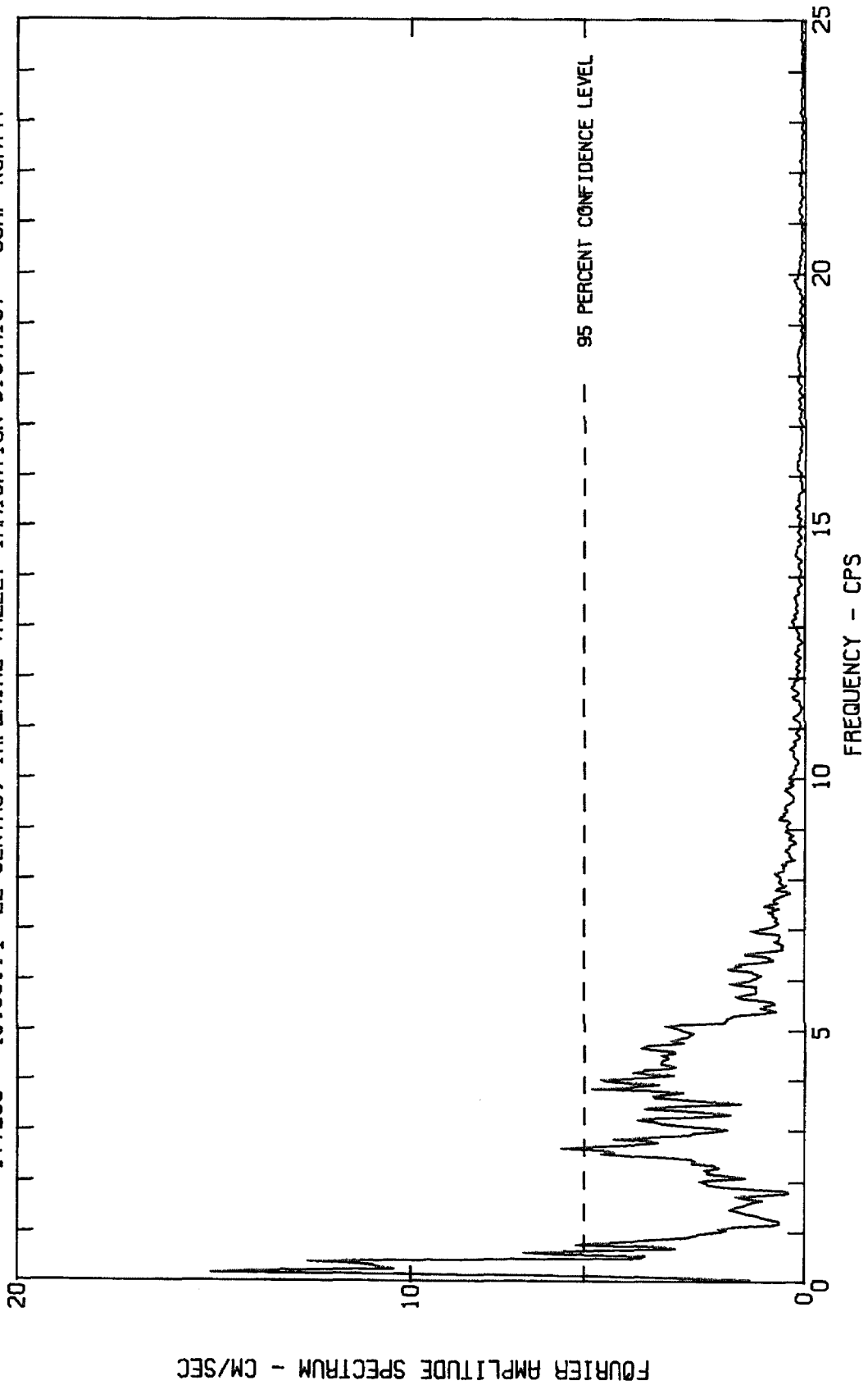
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IVT279 40.001.3 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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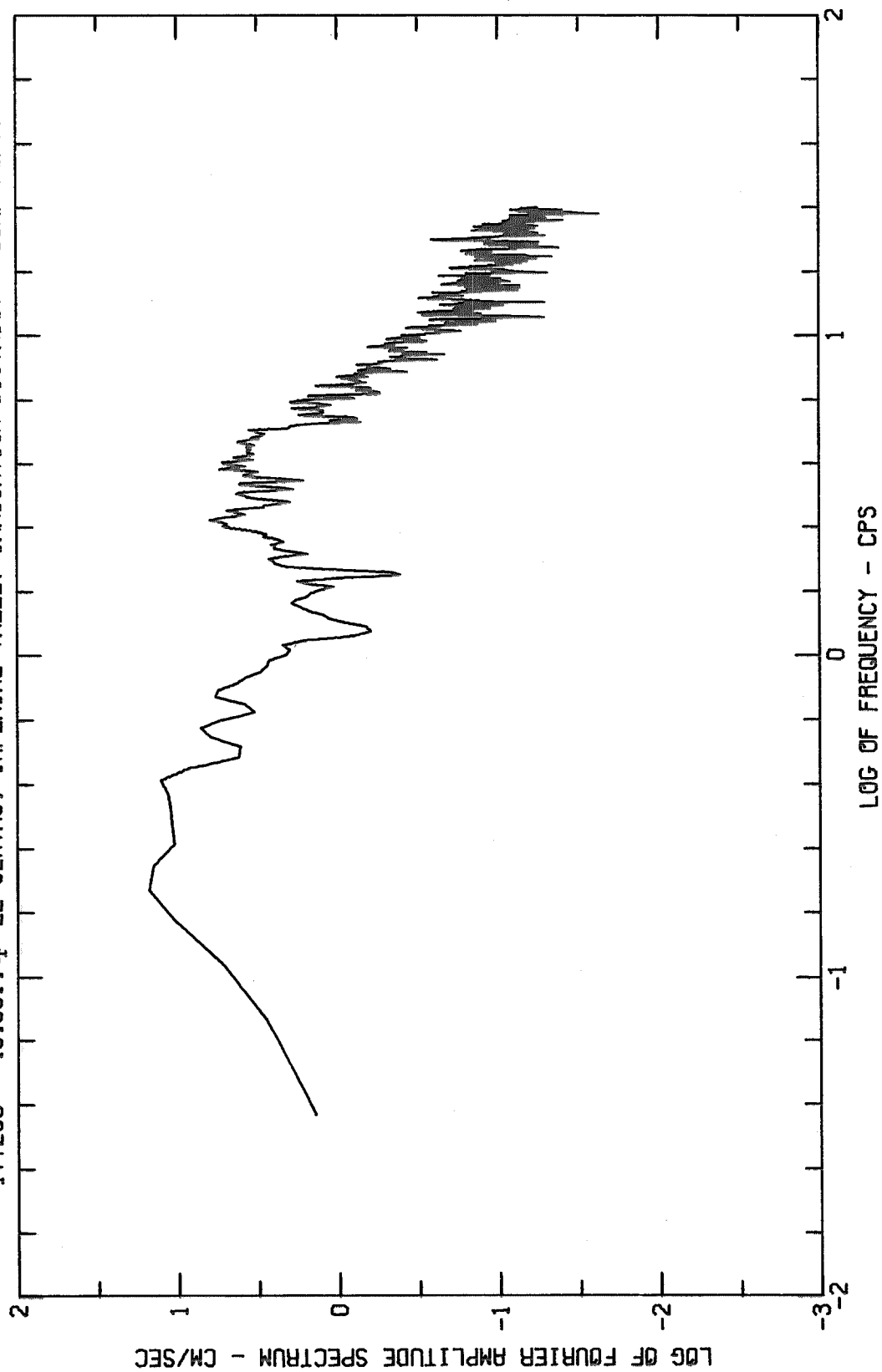


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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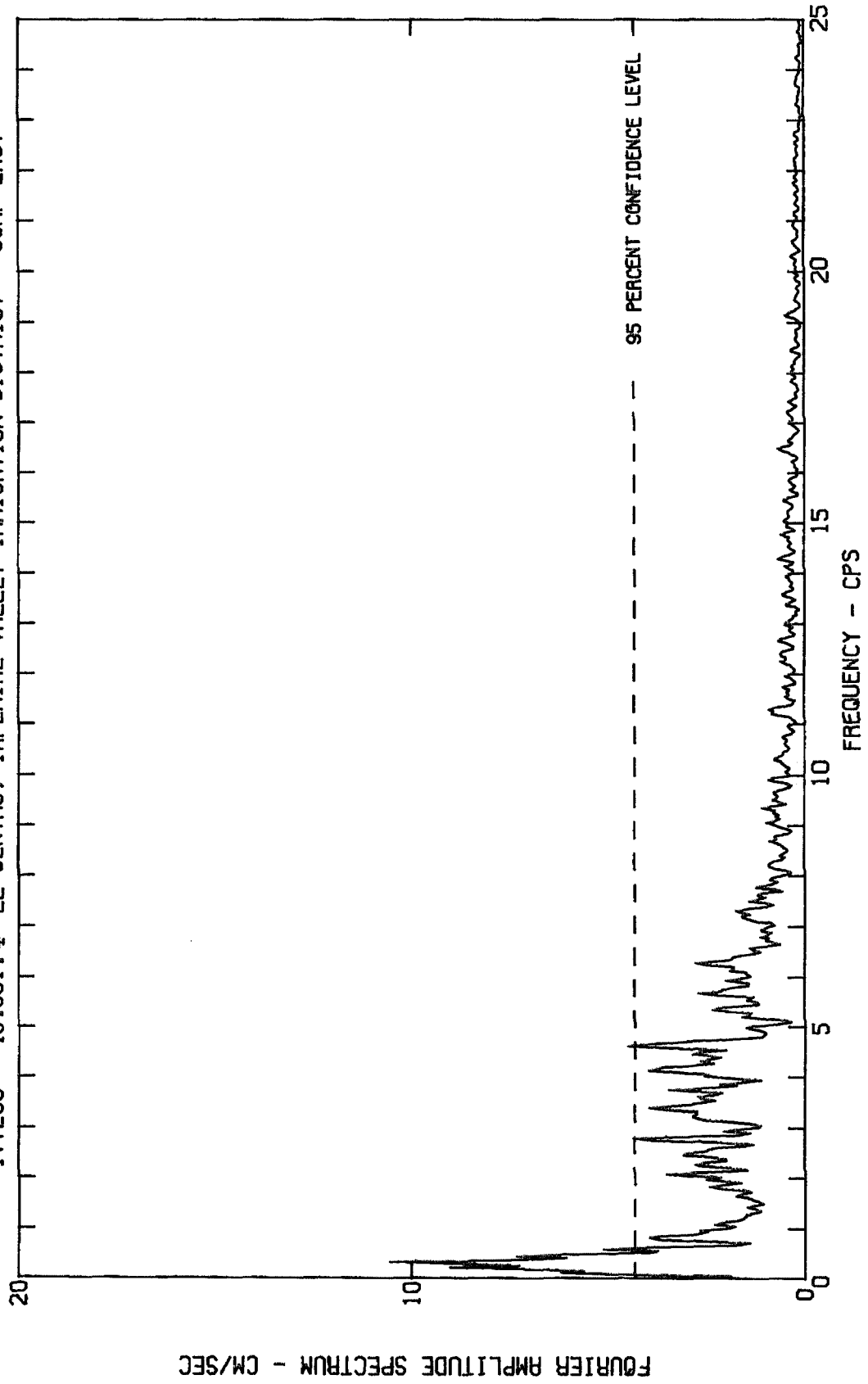




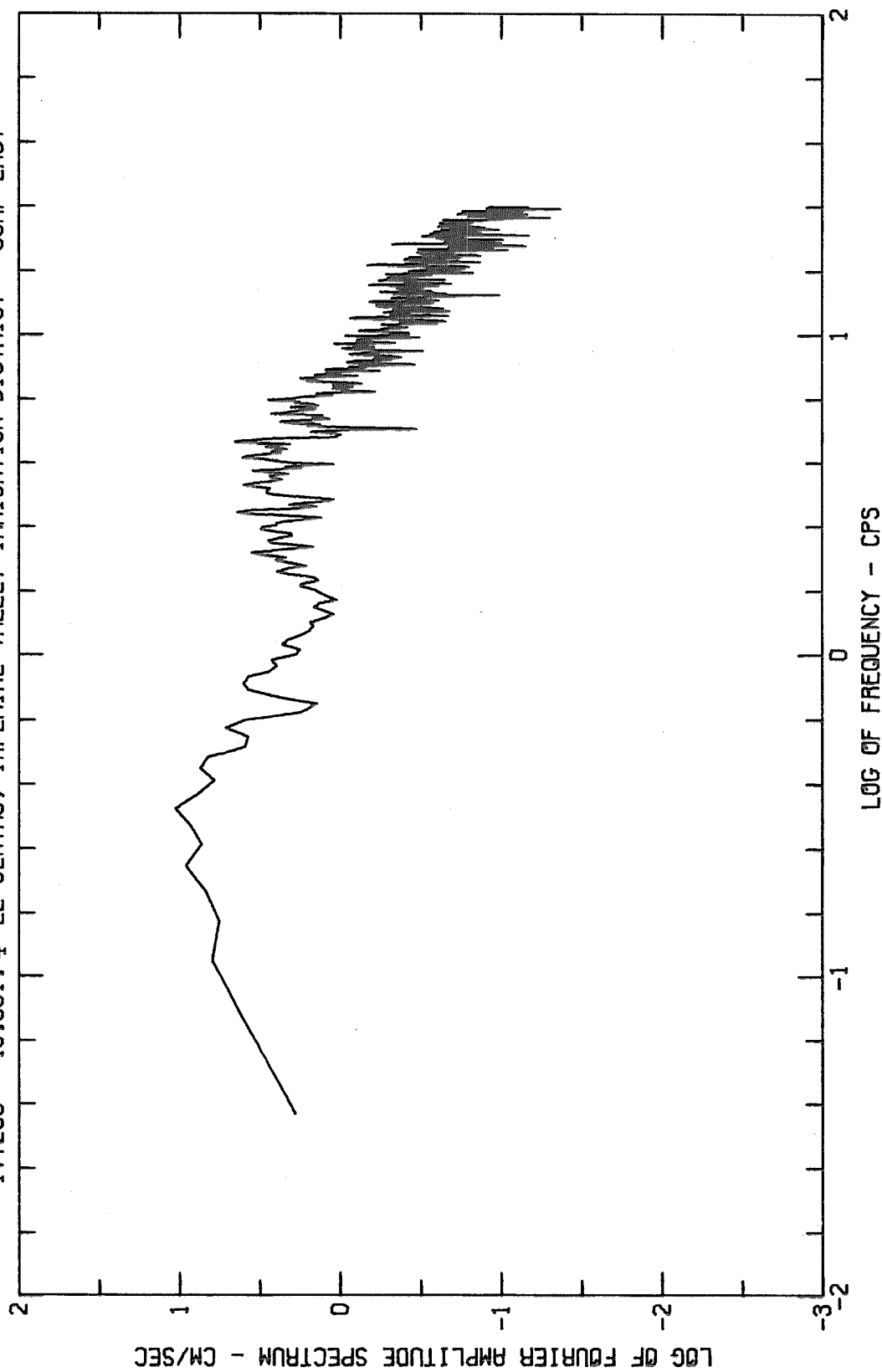
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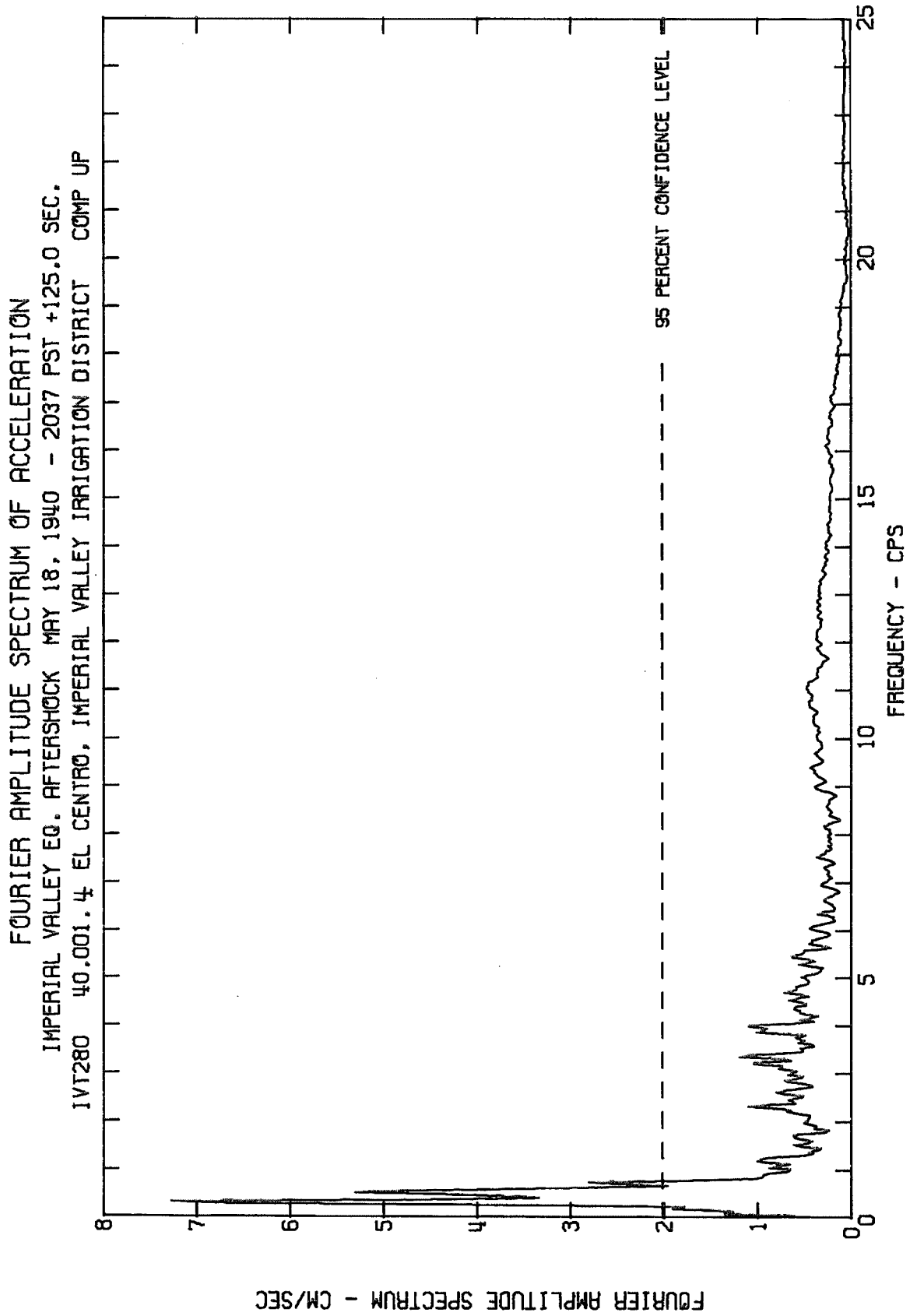


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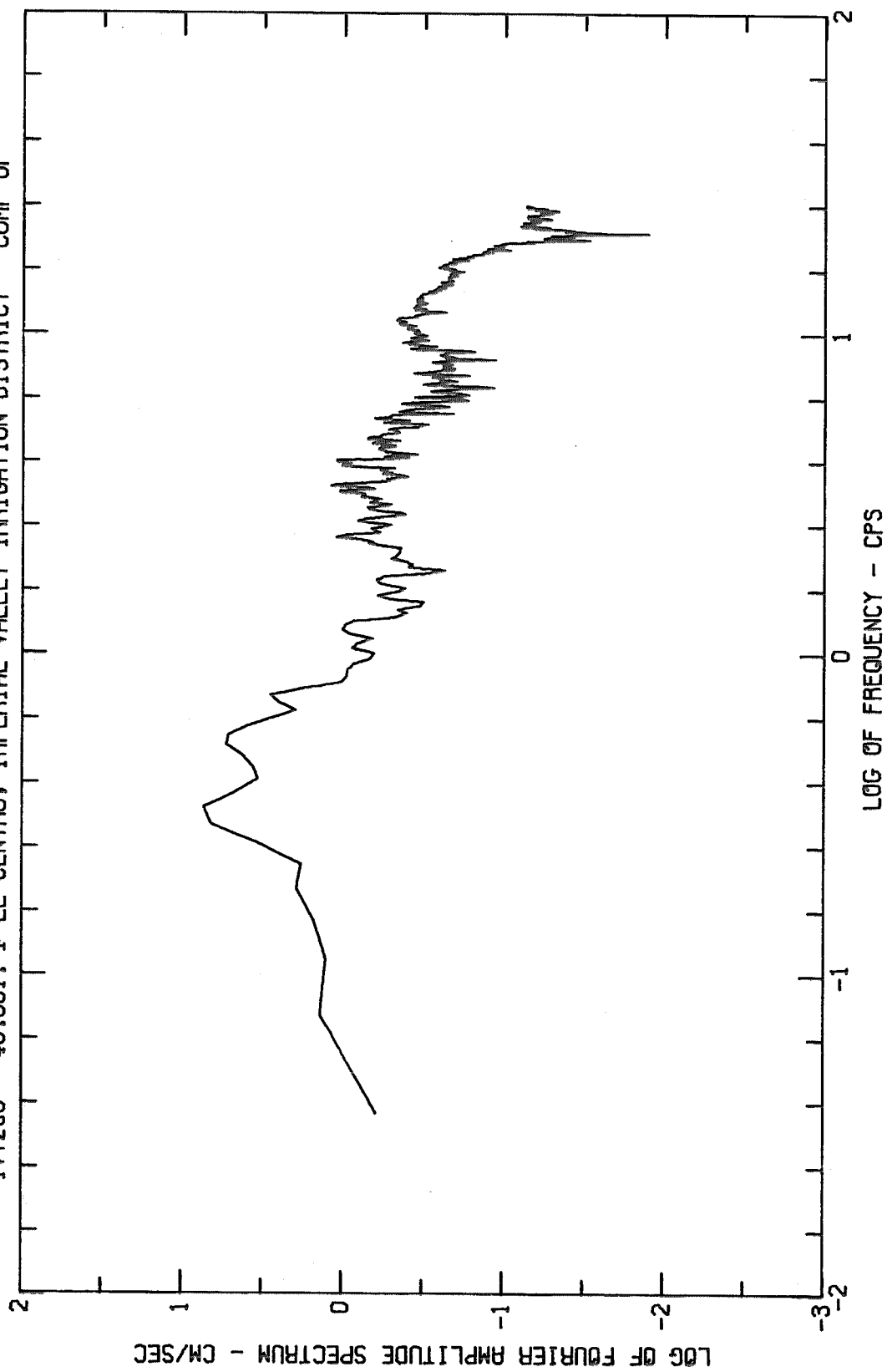


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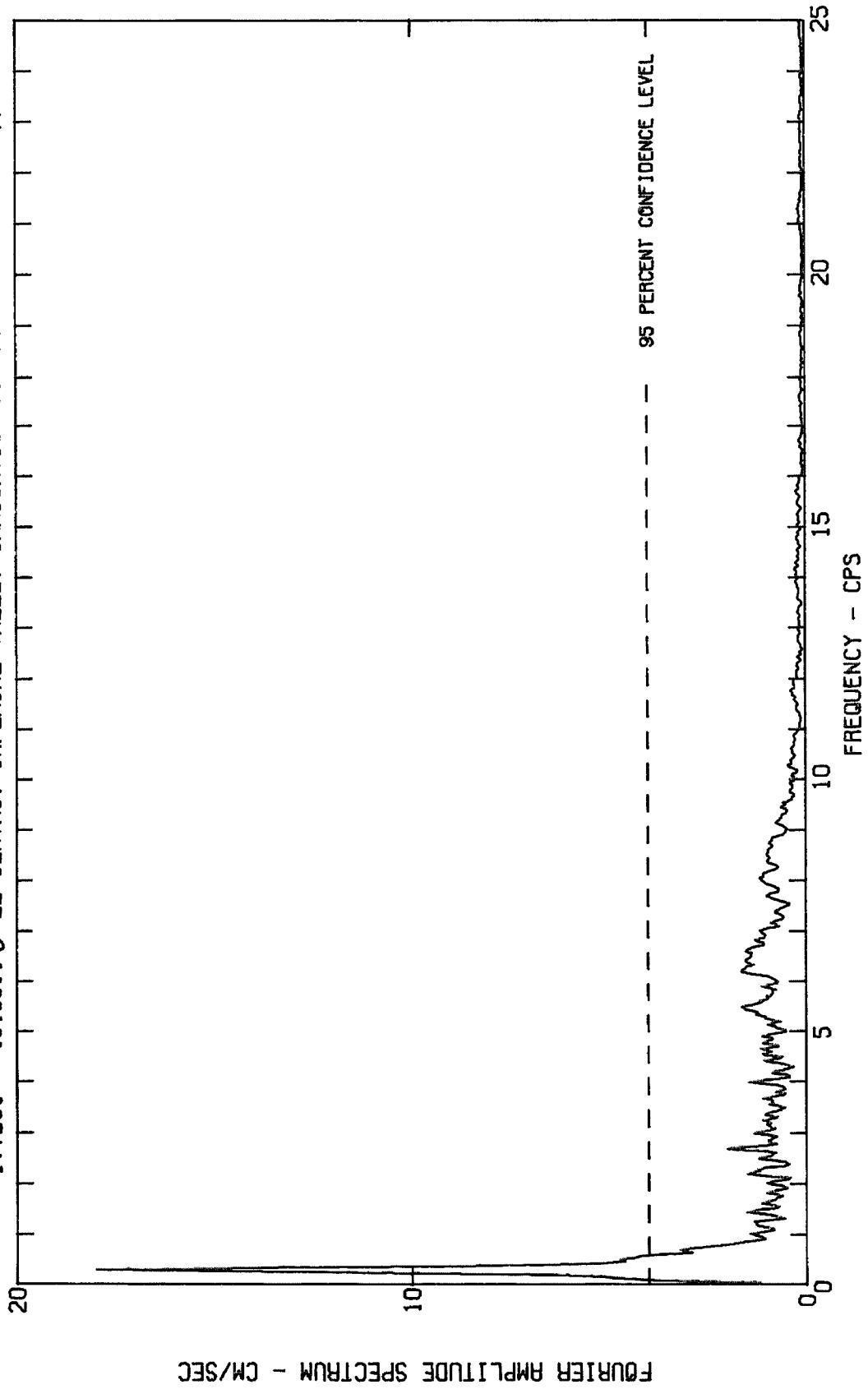




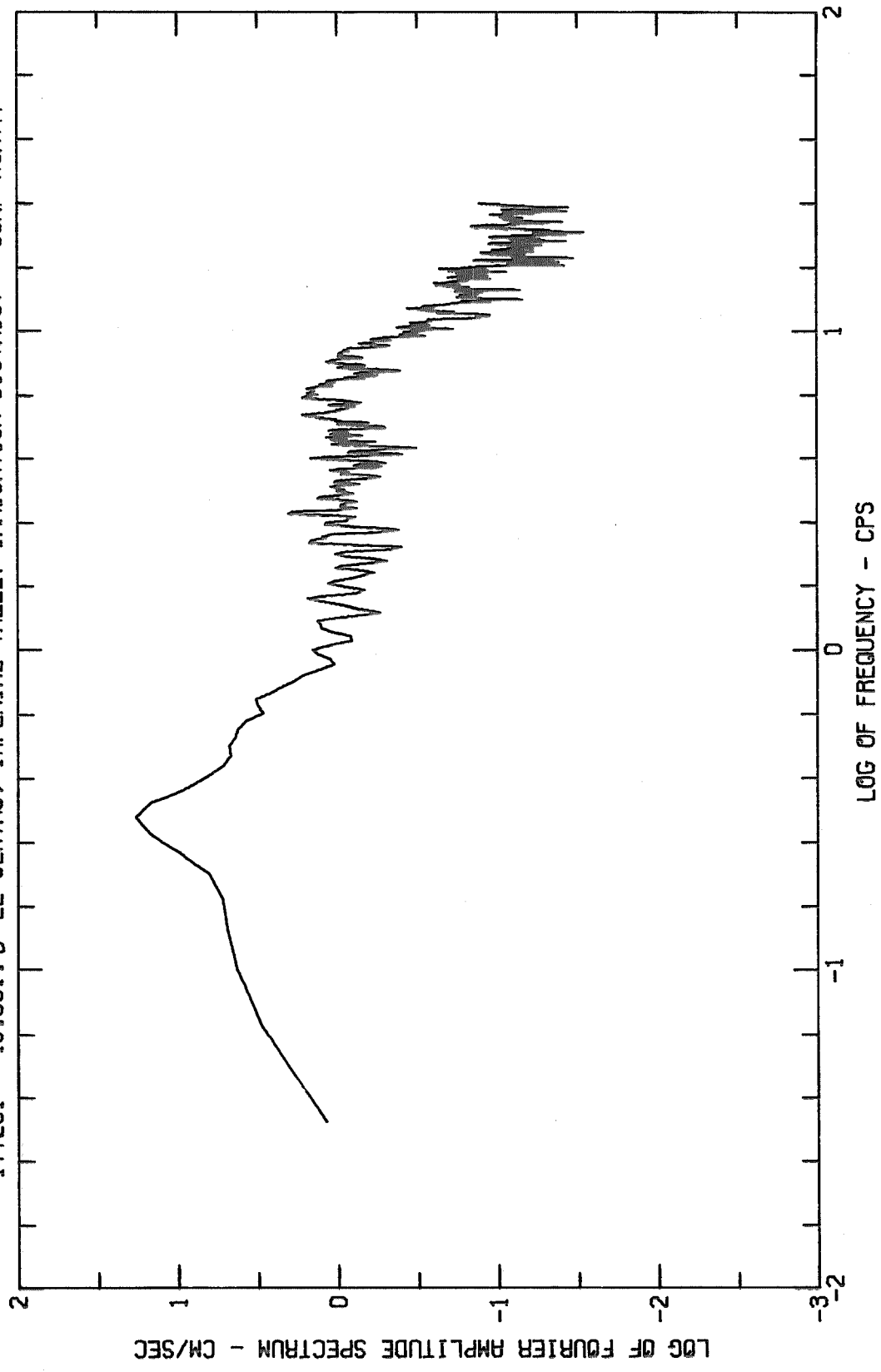
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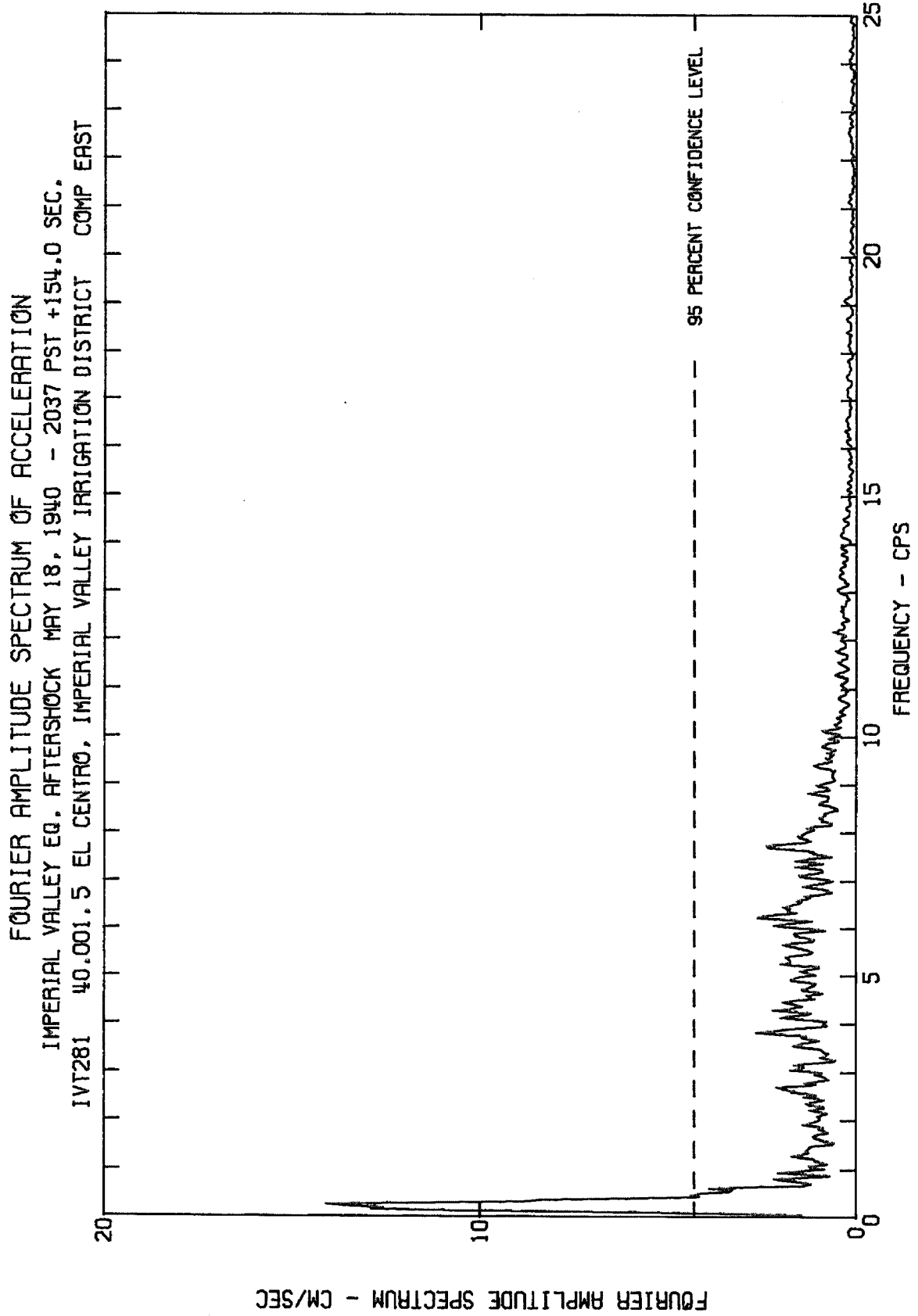


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1VT281 40.001.5 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



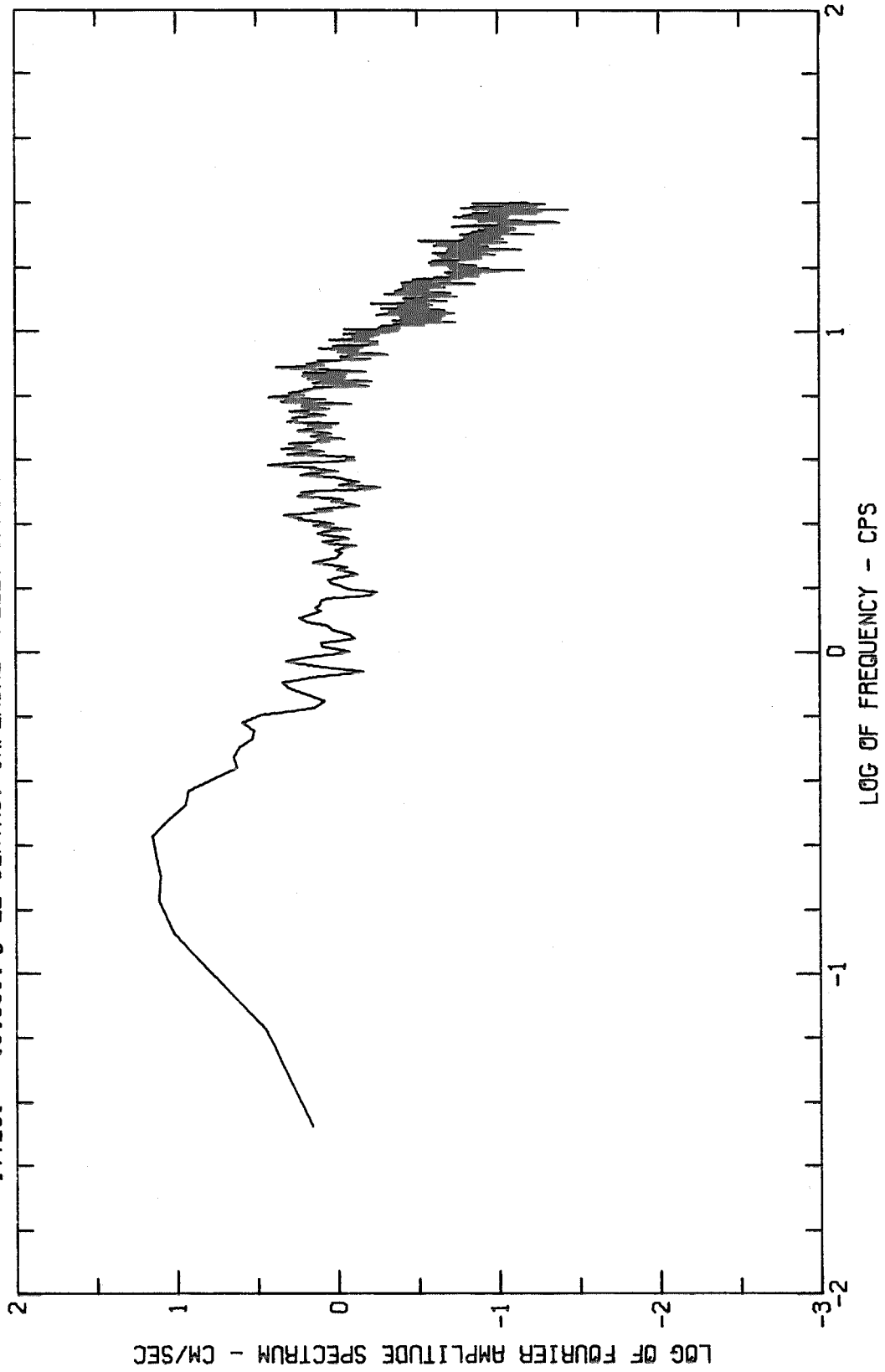
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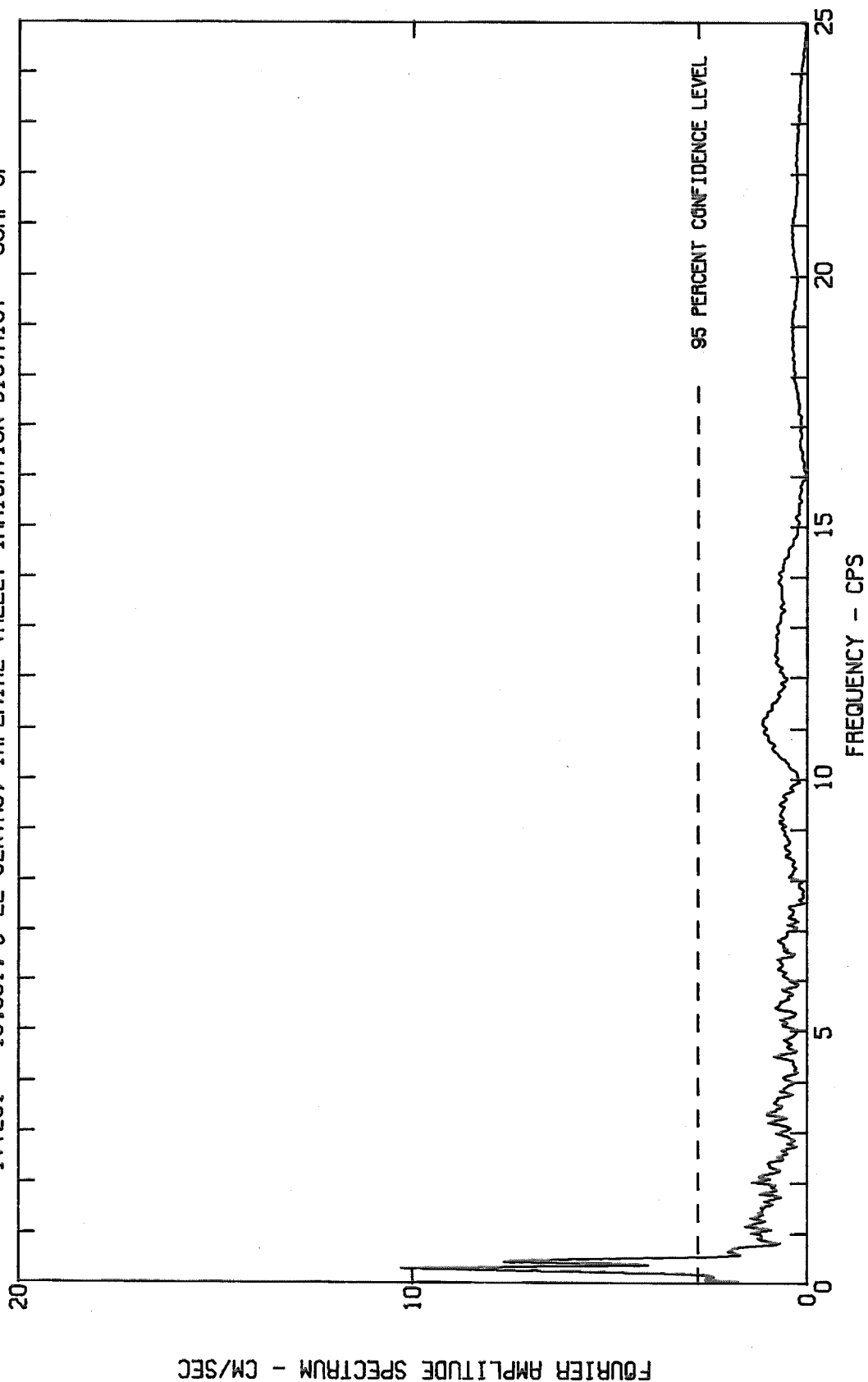




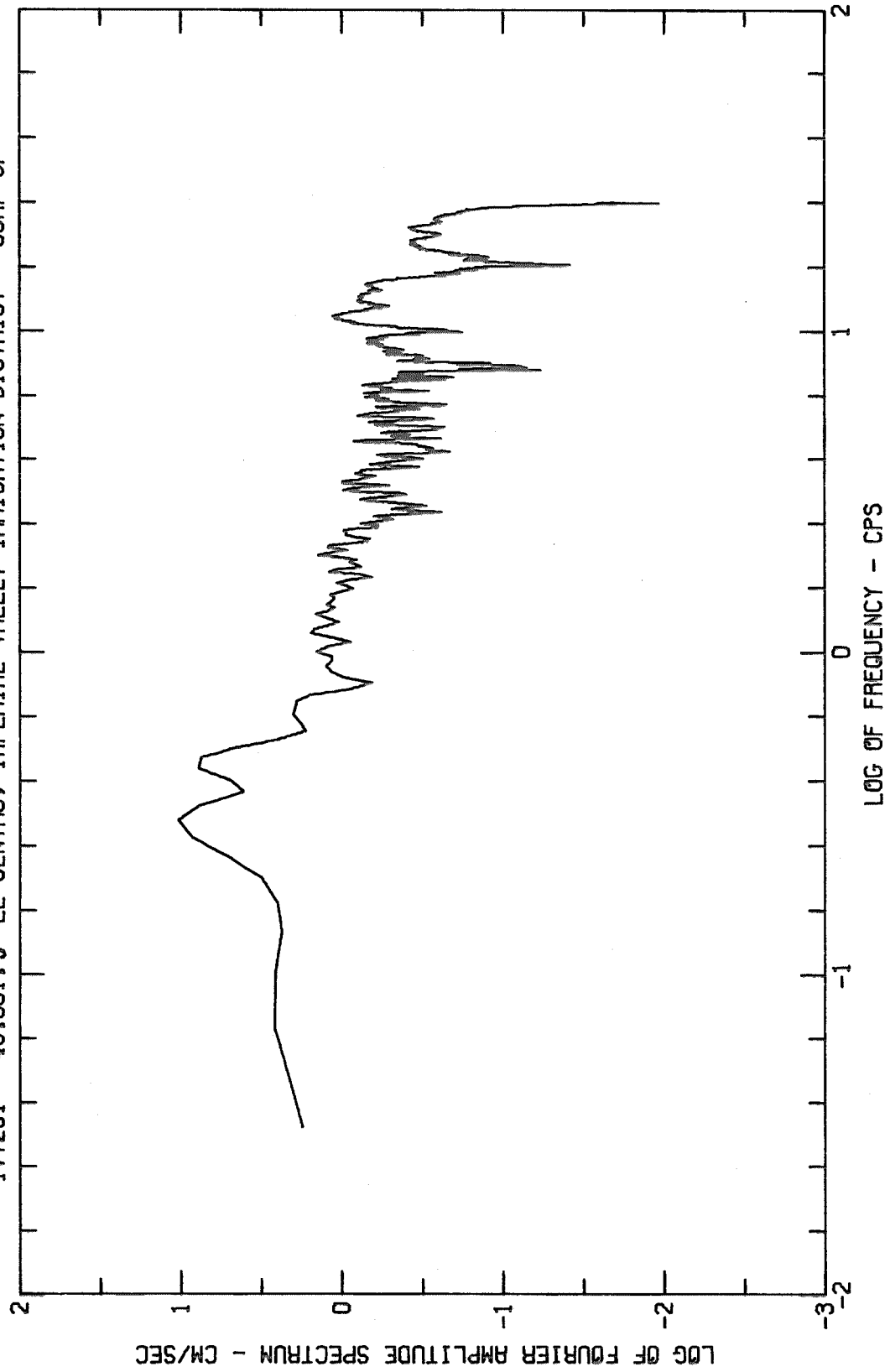
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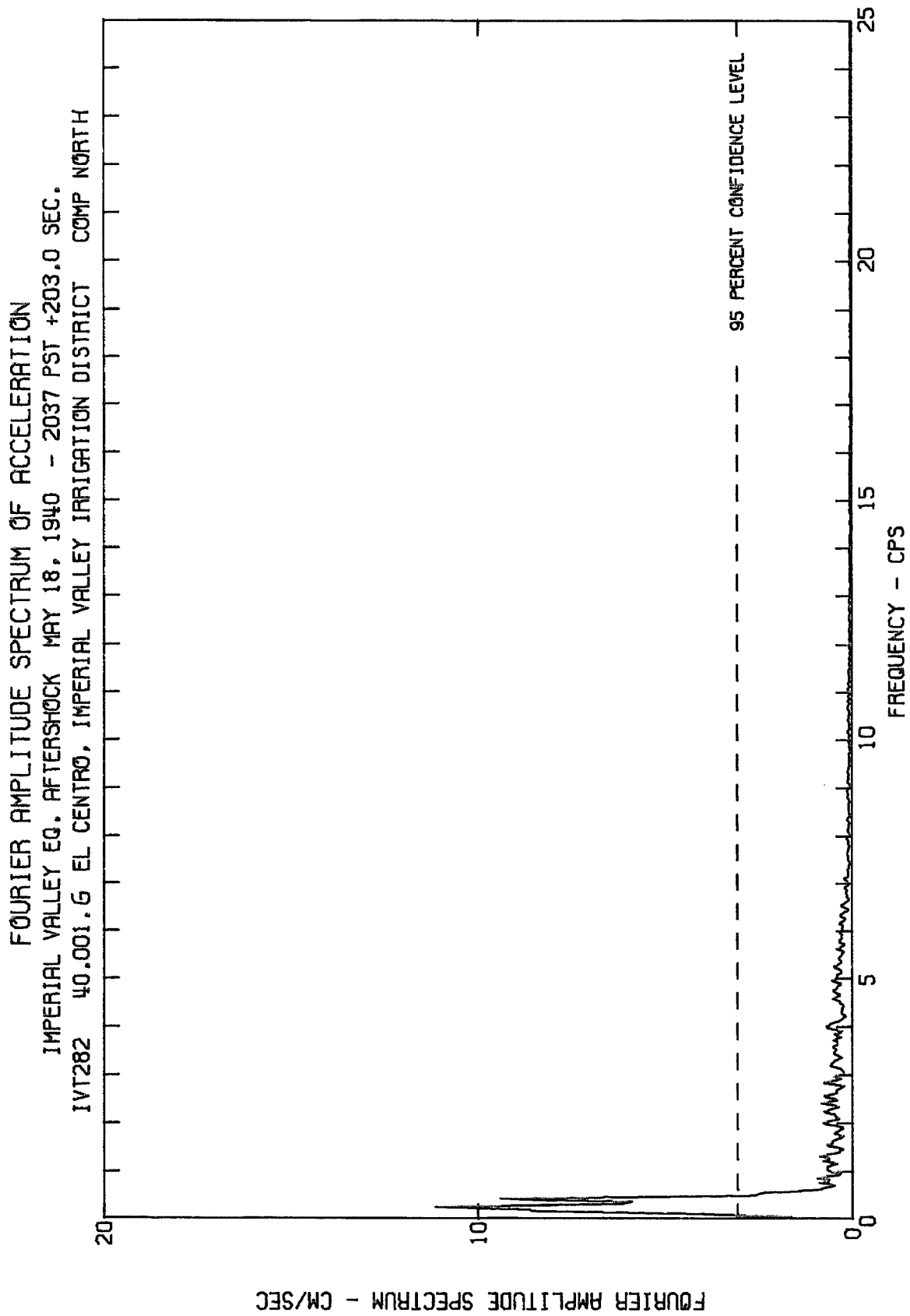


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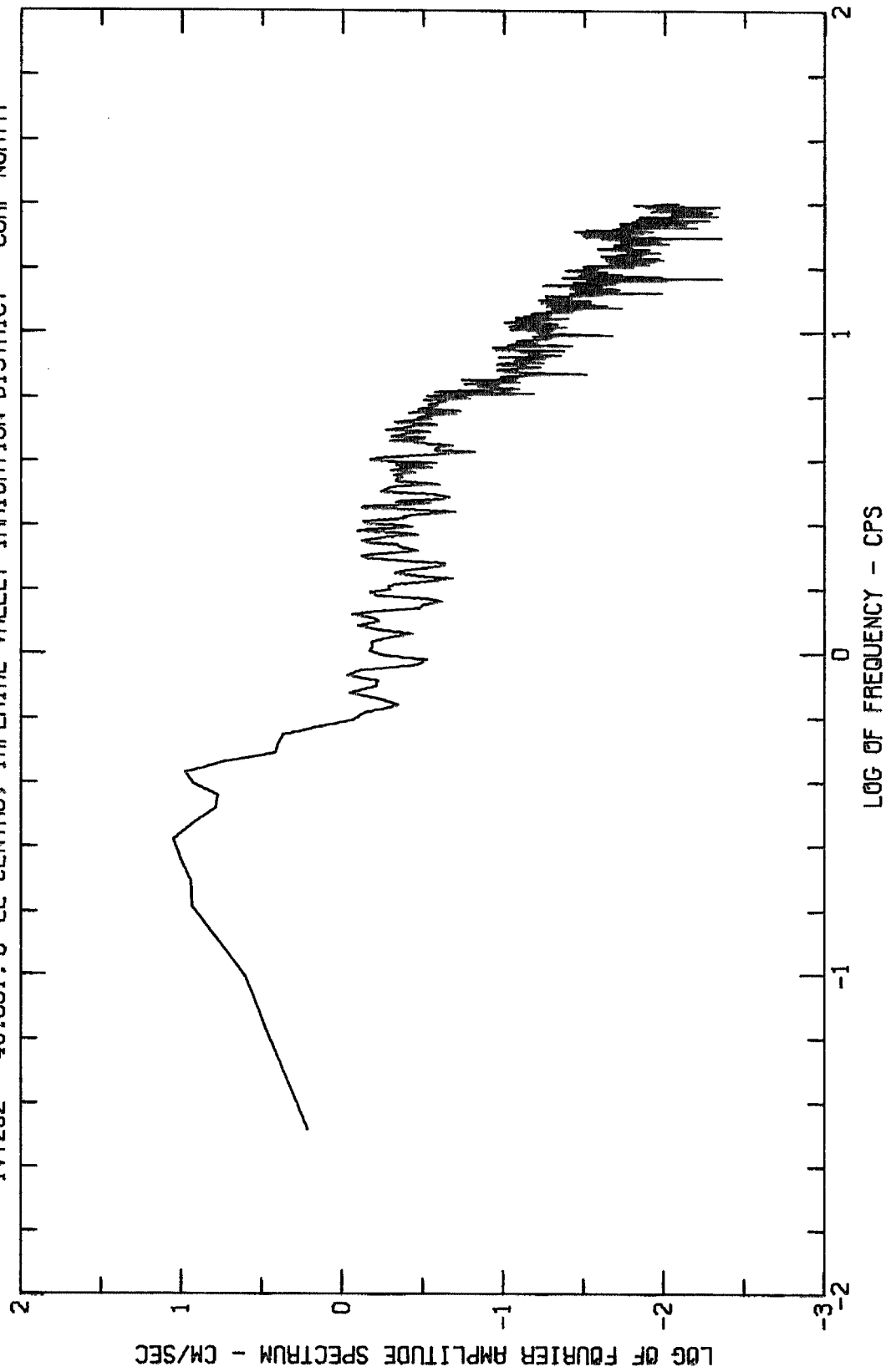


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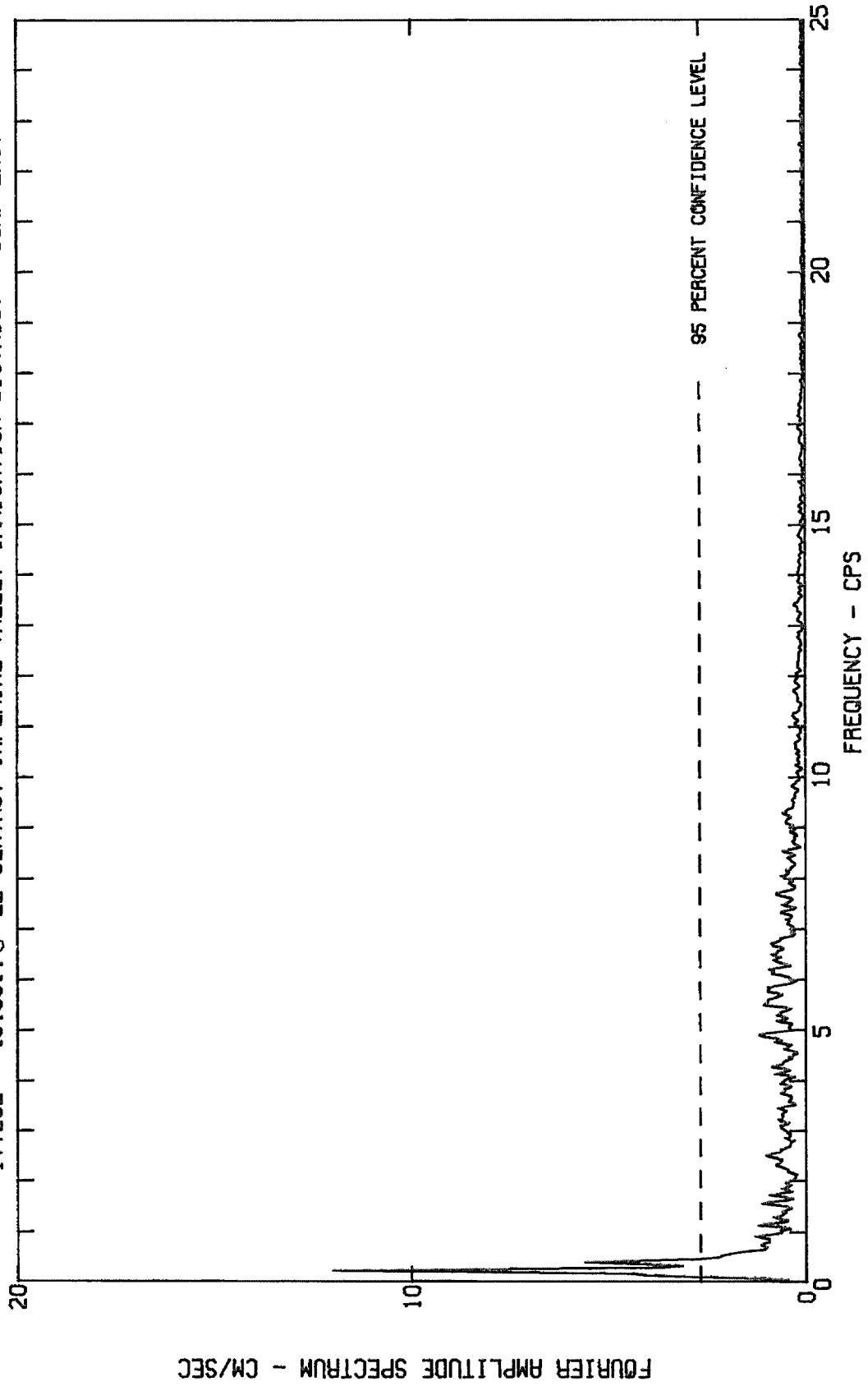




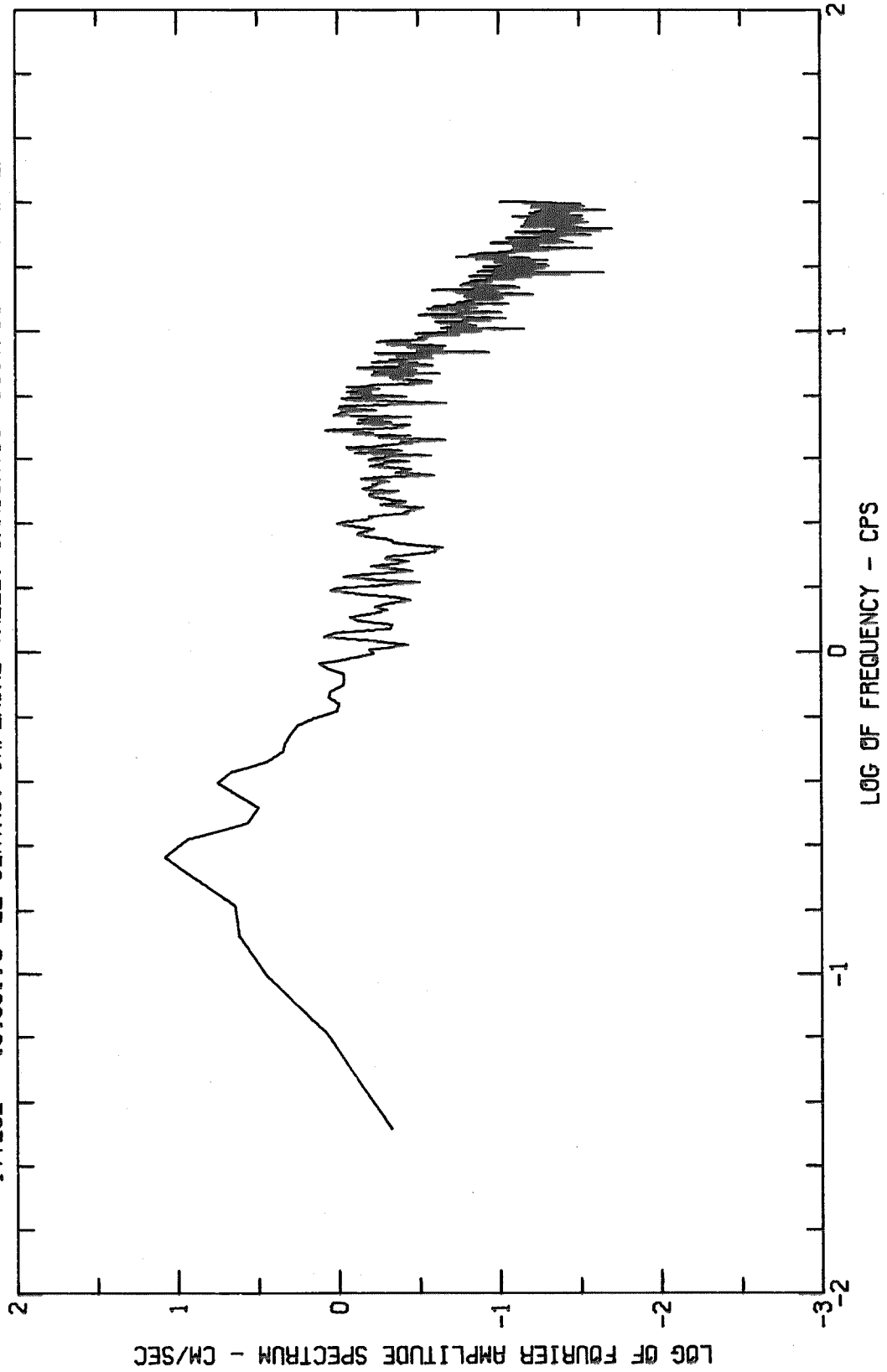
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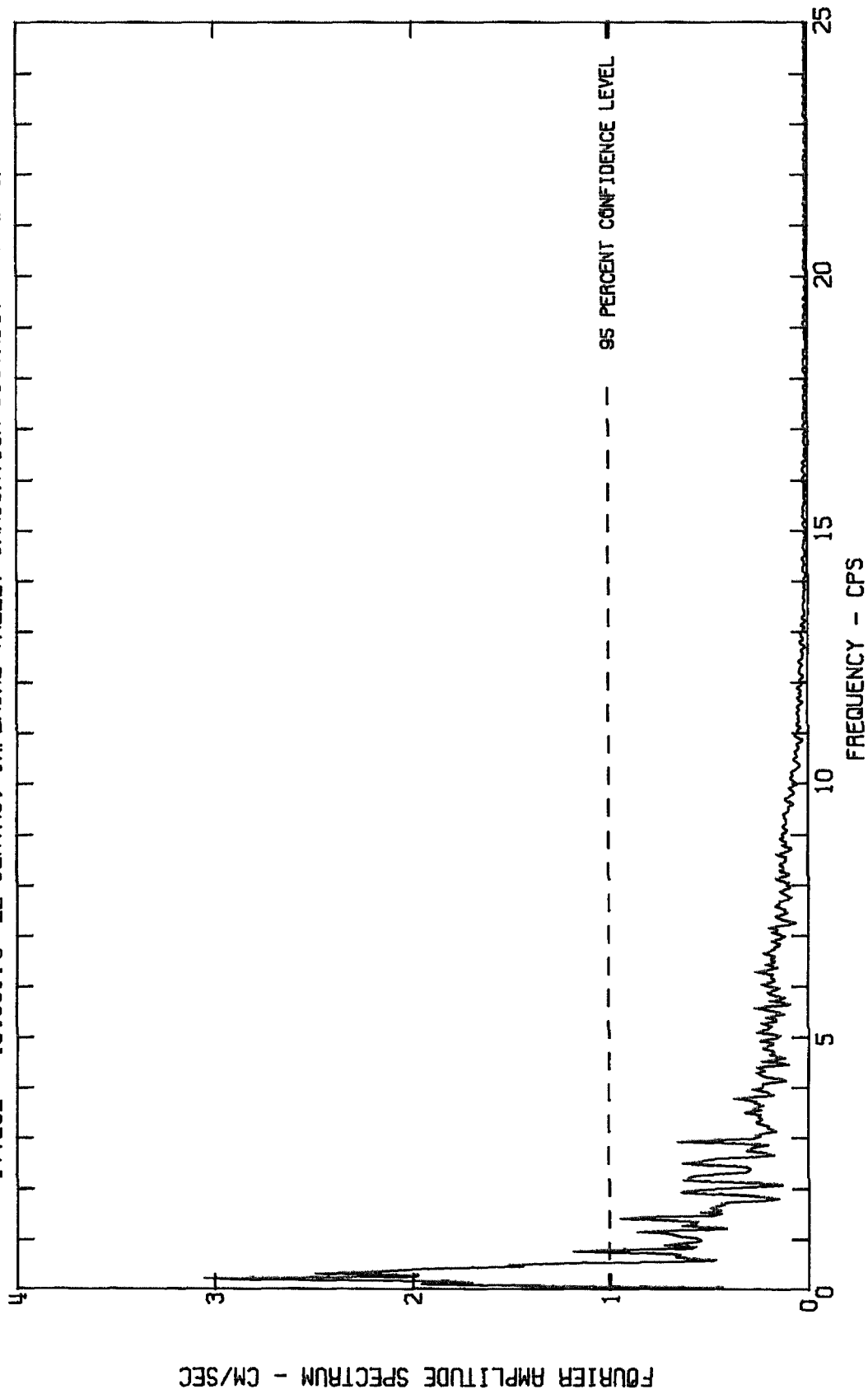
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IVT282 40.001.6 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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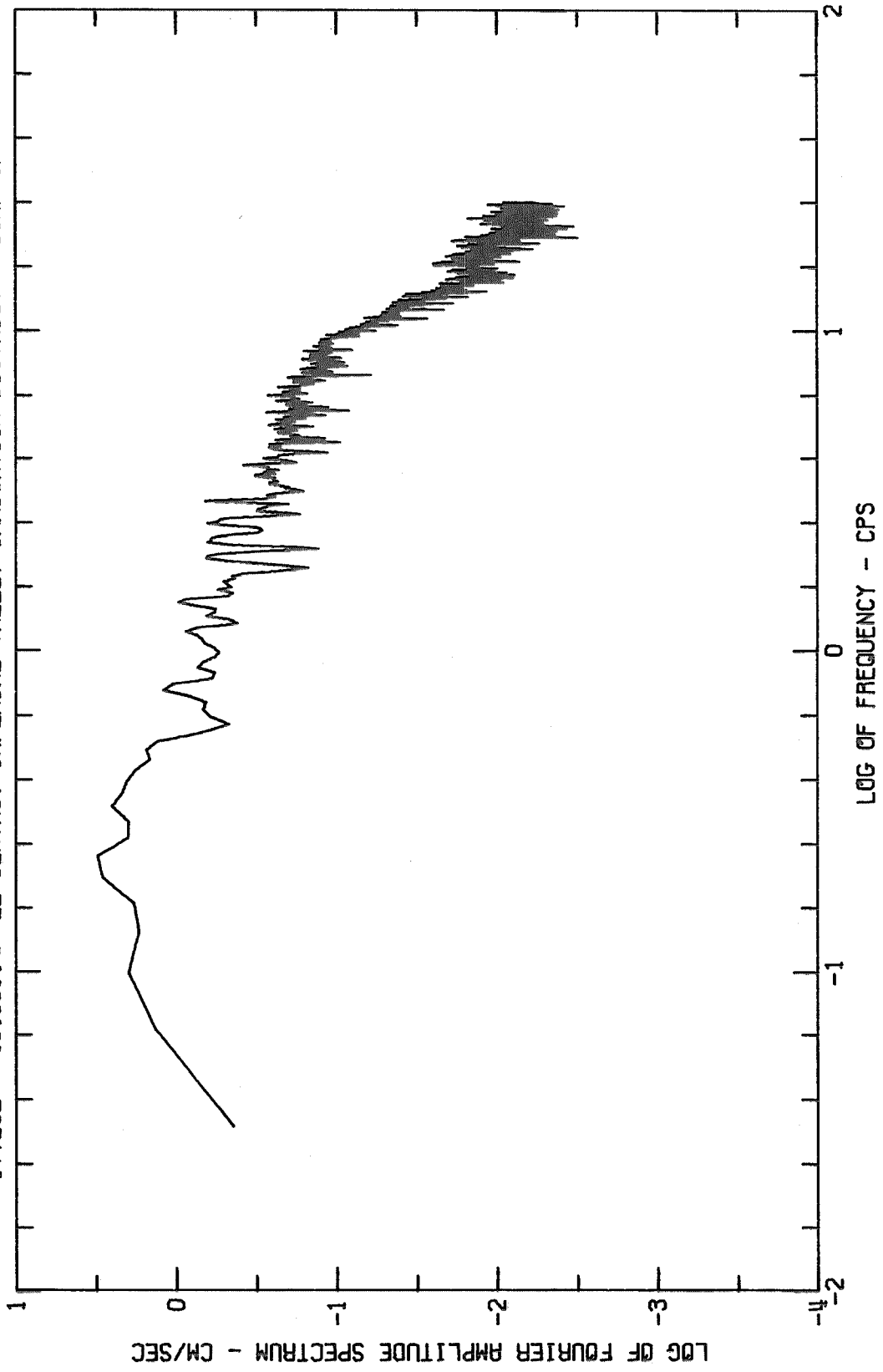


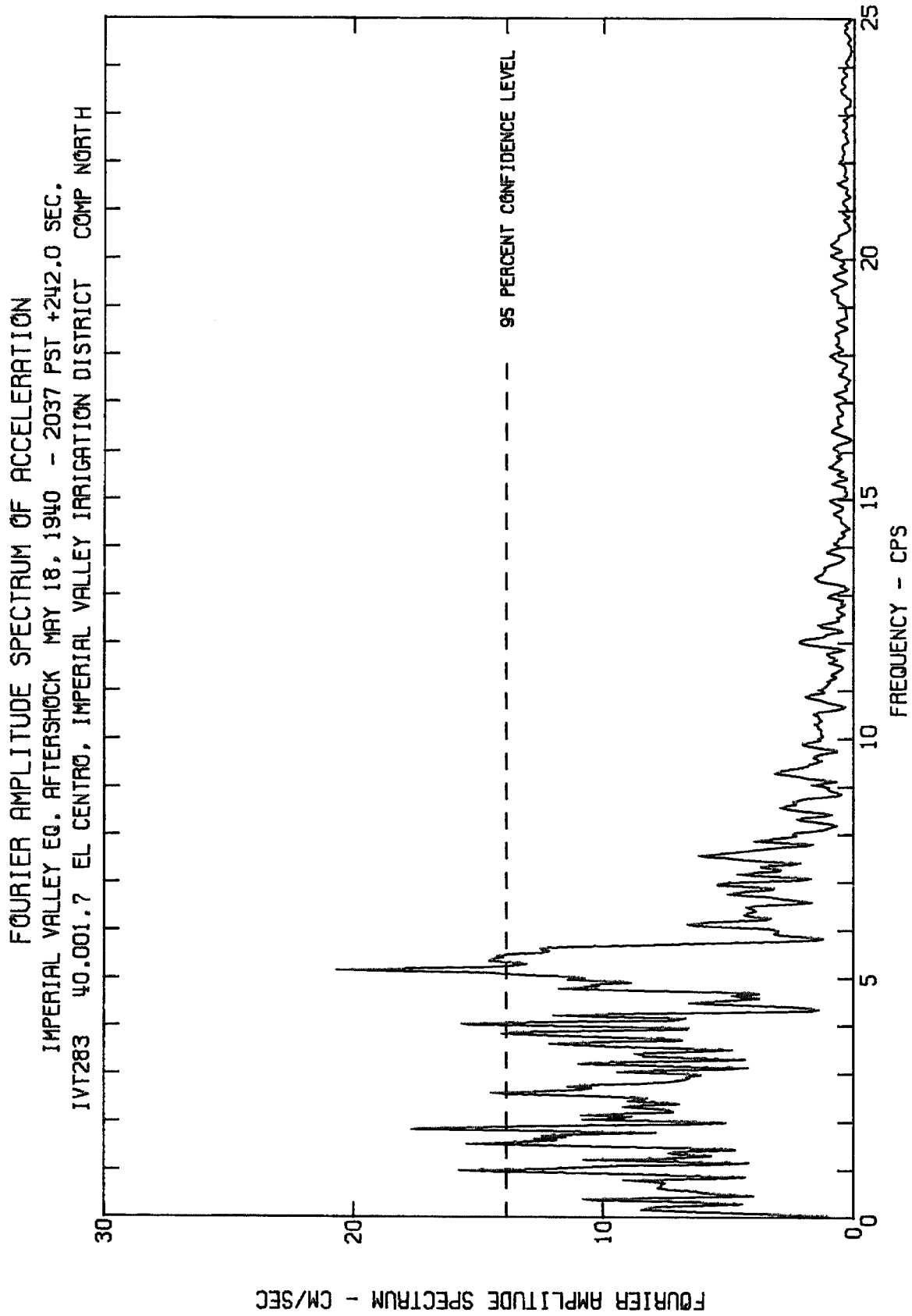
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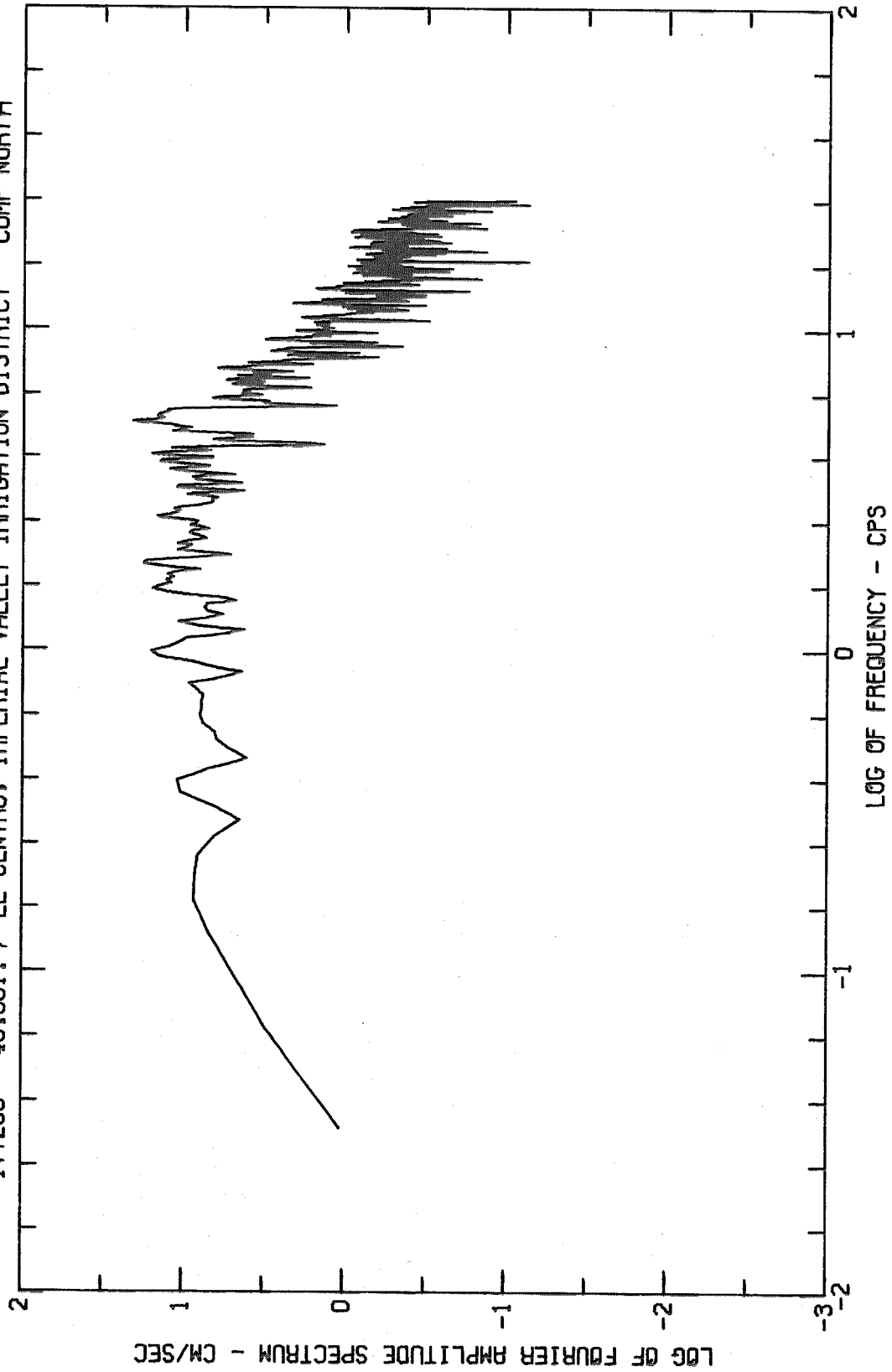


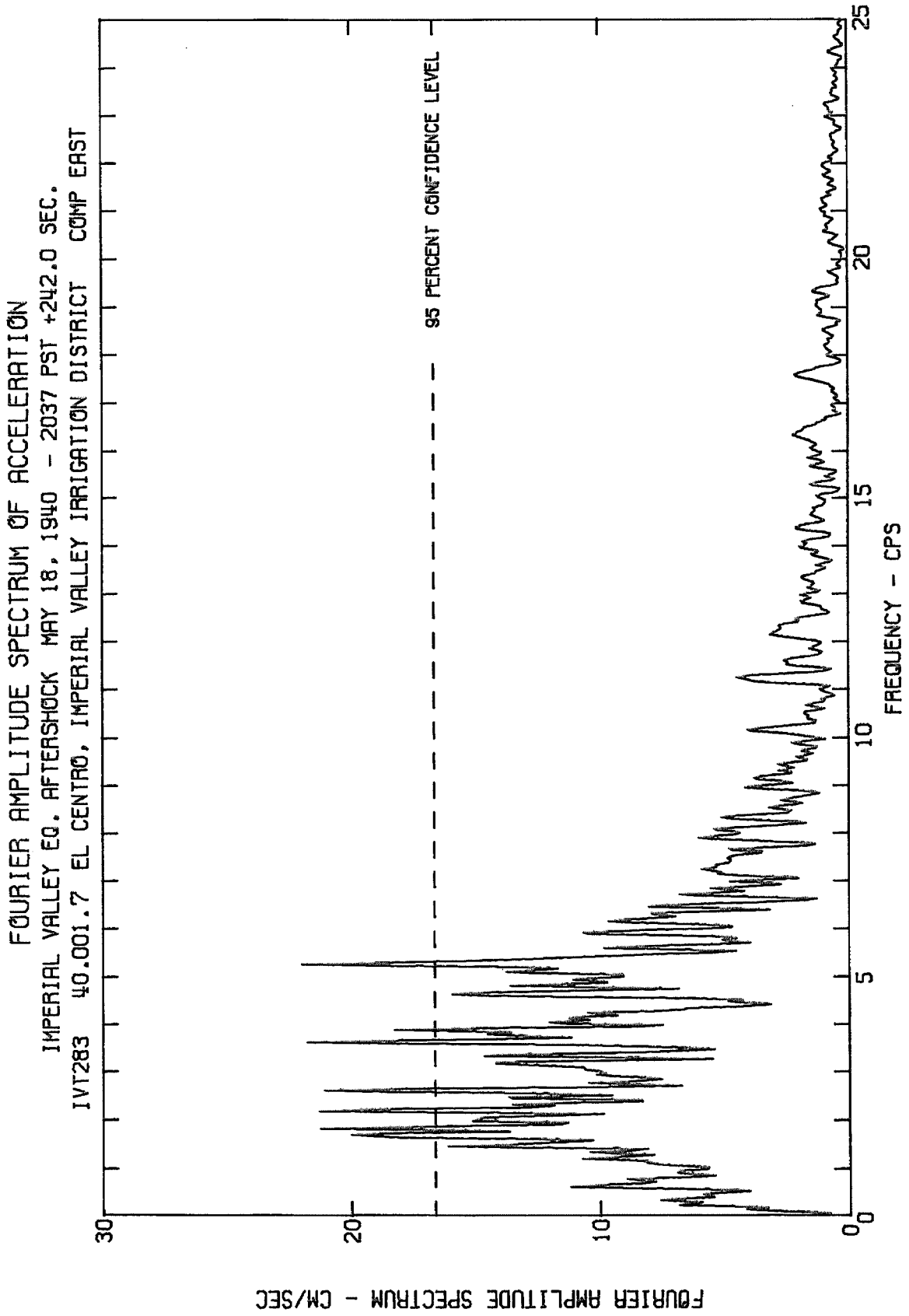
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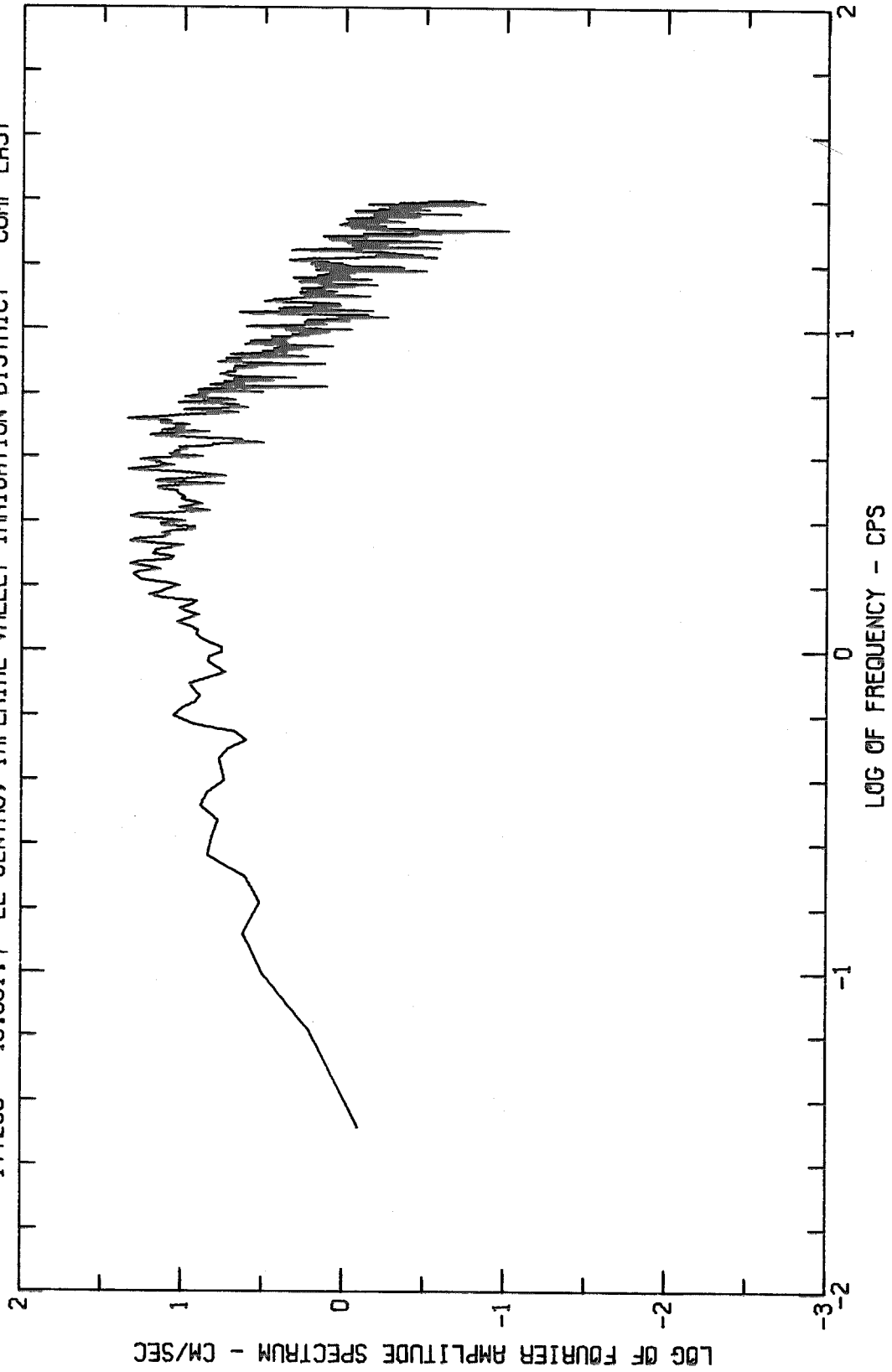


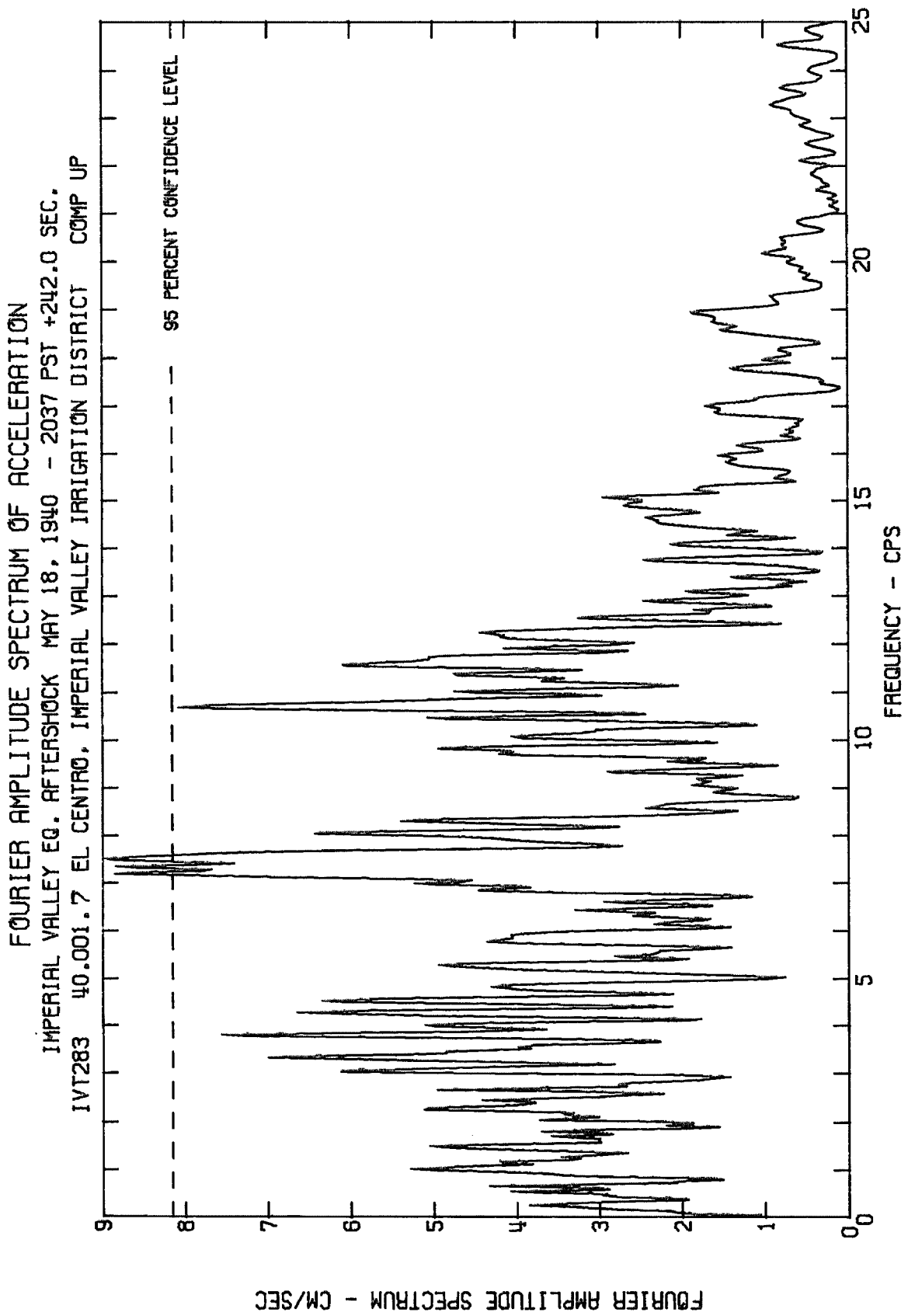
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IVT283 40.001.7 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



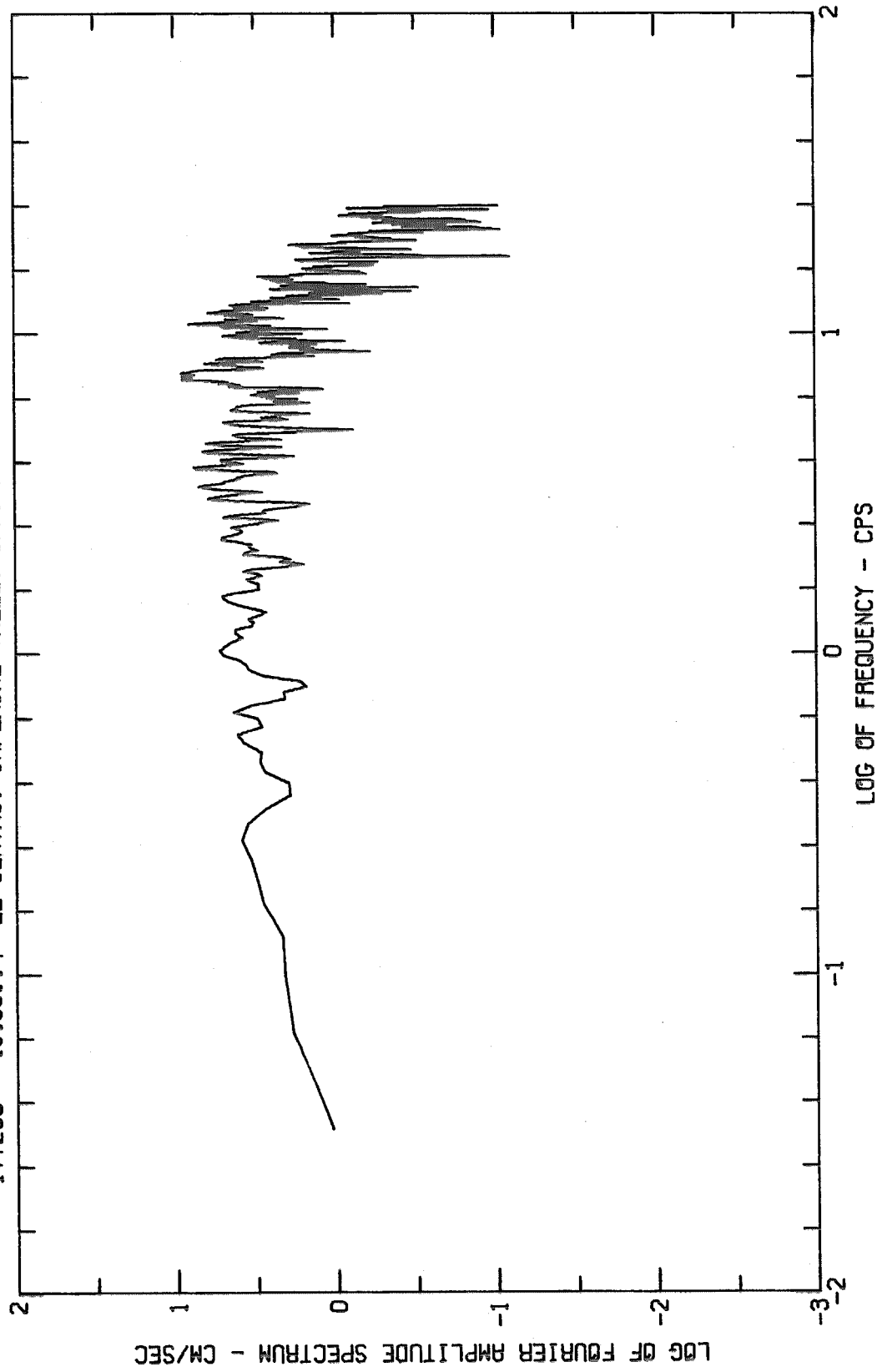


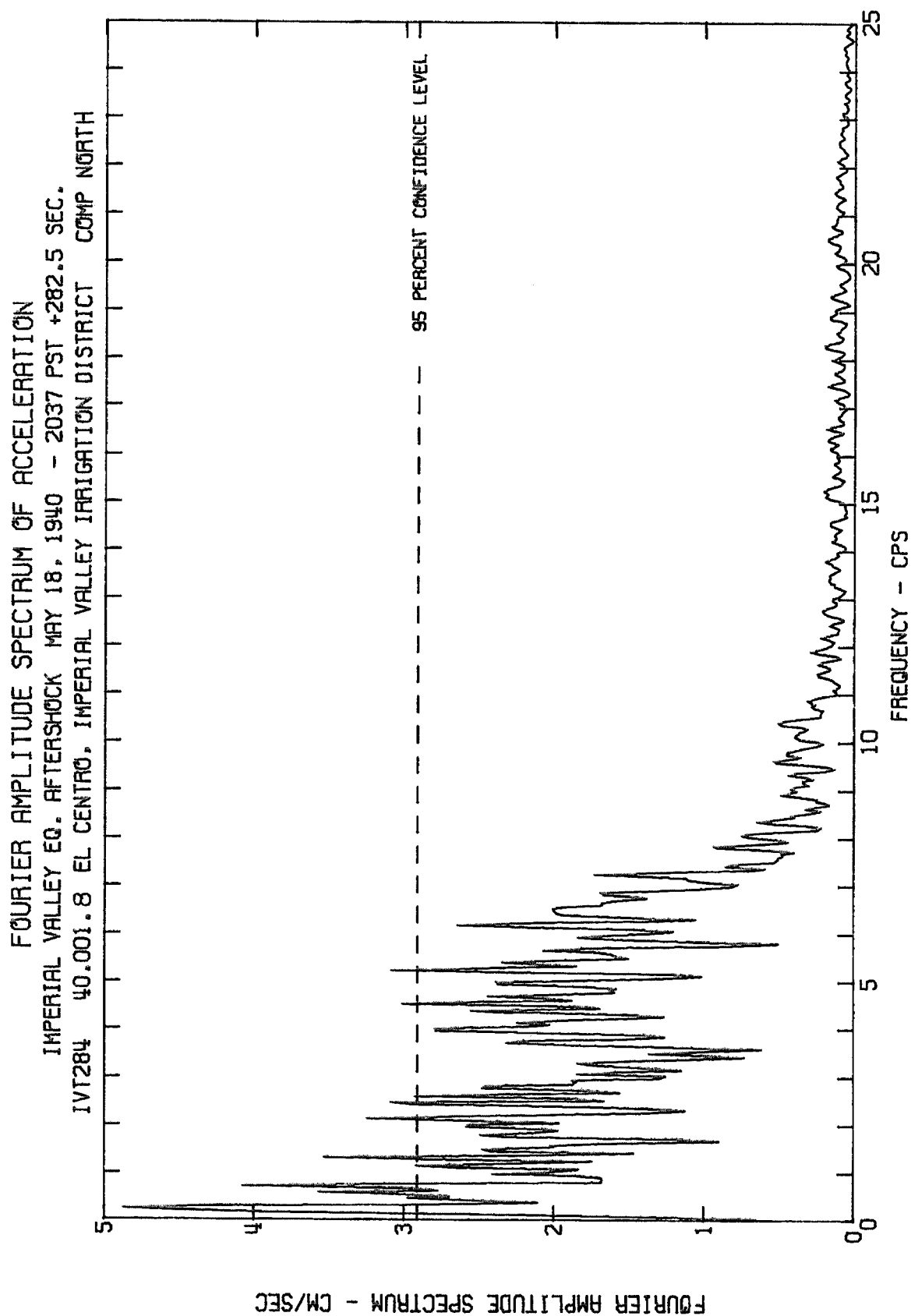
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EQ. AFTERSHOCK MAY 18, 1940 - 2037 PST +242.0 SEC.  
IVT283 40.001.7 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST





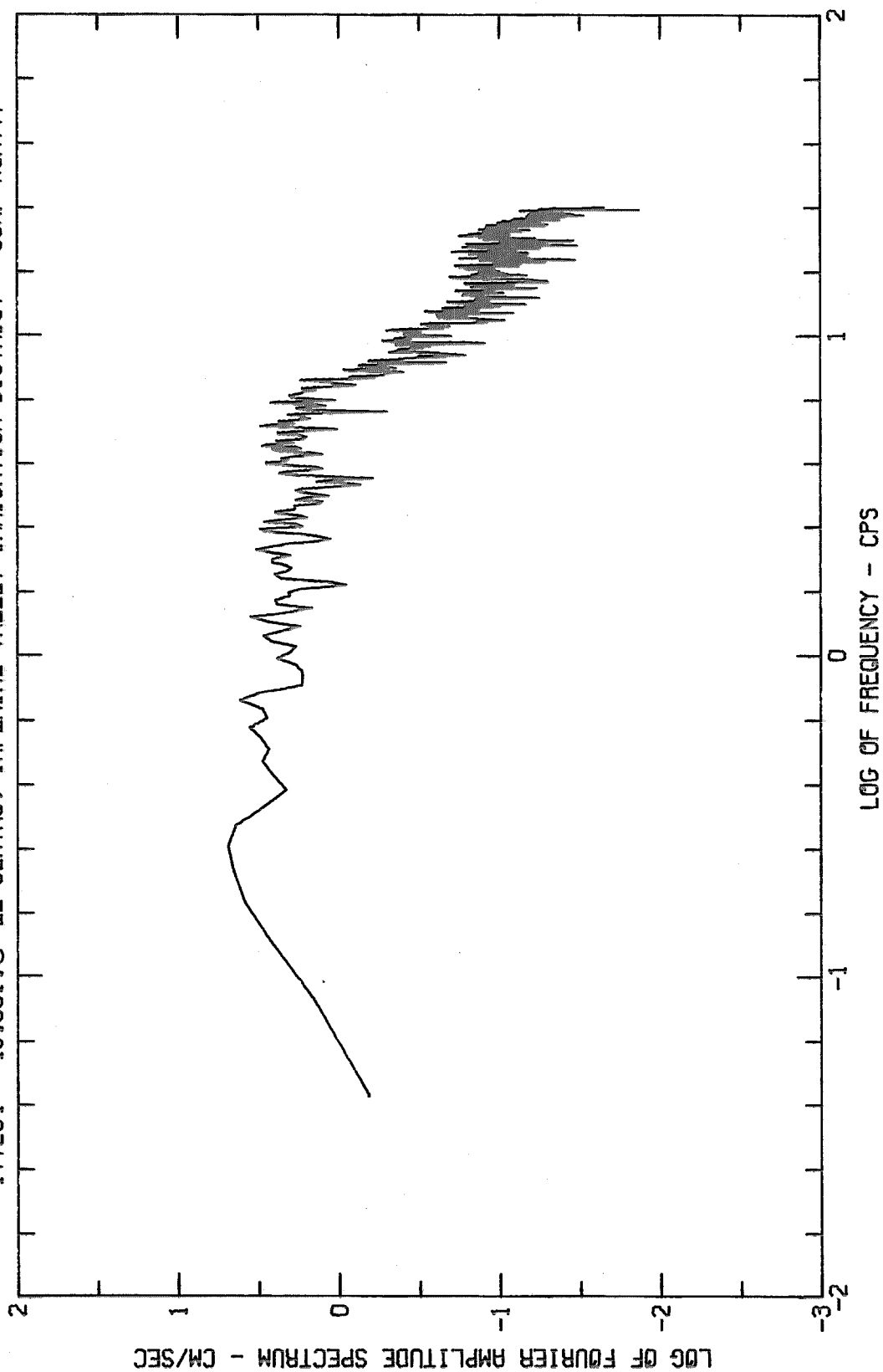
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1VT283 40.001.7 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP

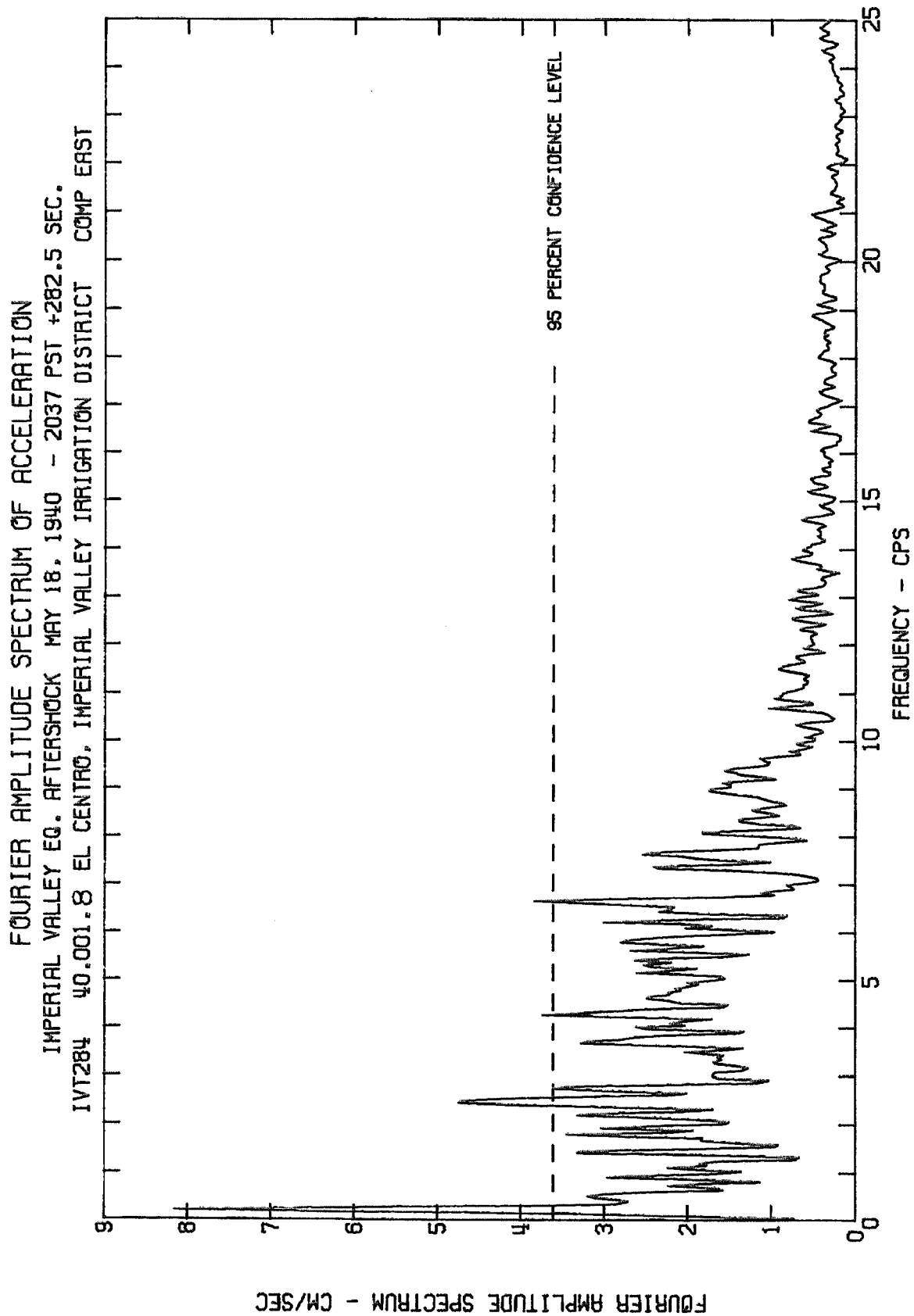




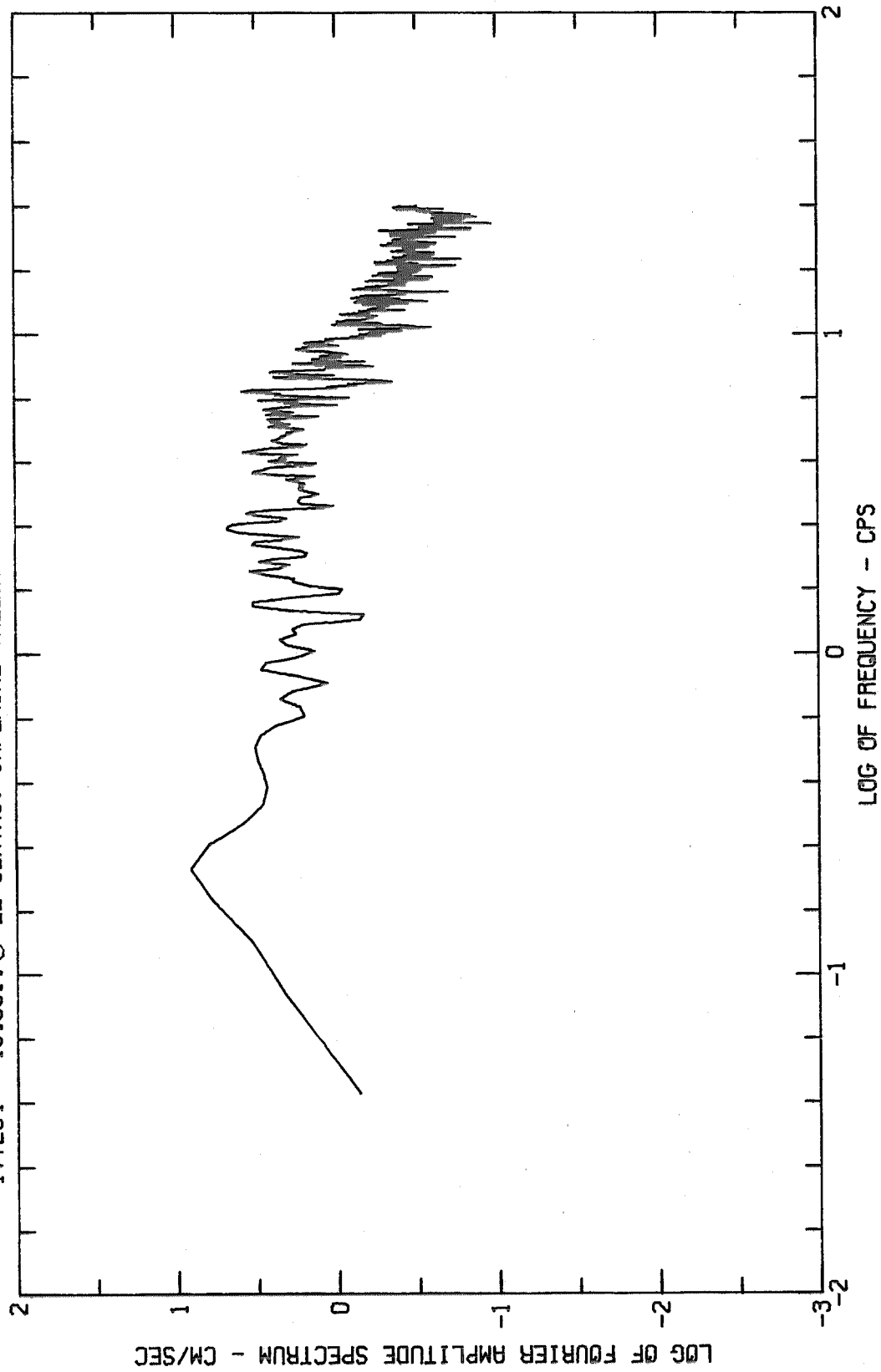


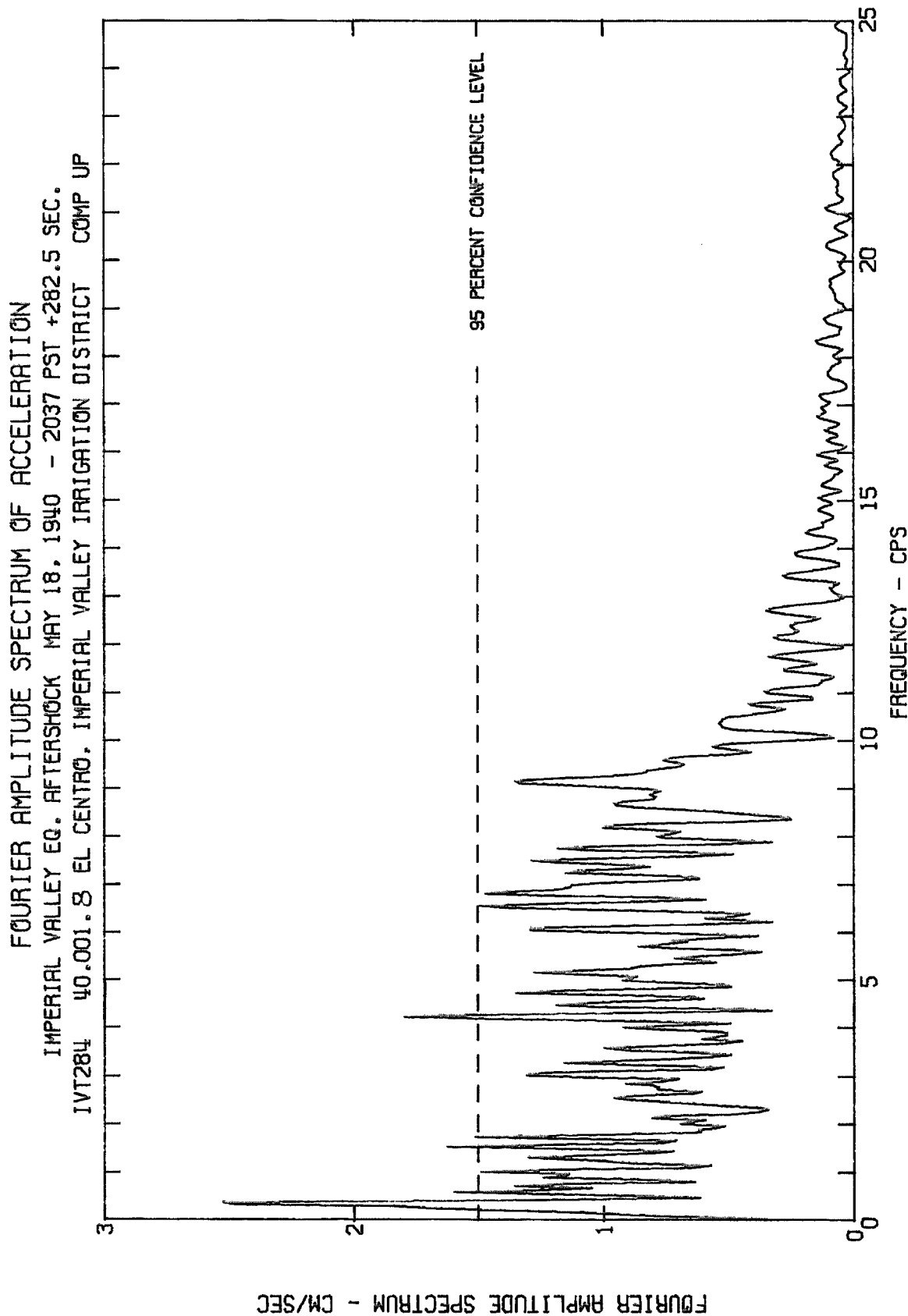
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EQ. AFTERSHOCK MAY 18, 1940 - 2037 PST +282.5 SEC.  
1VT284 40.001.8 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



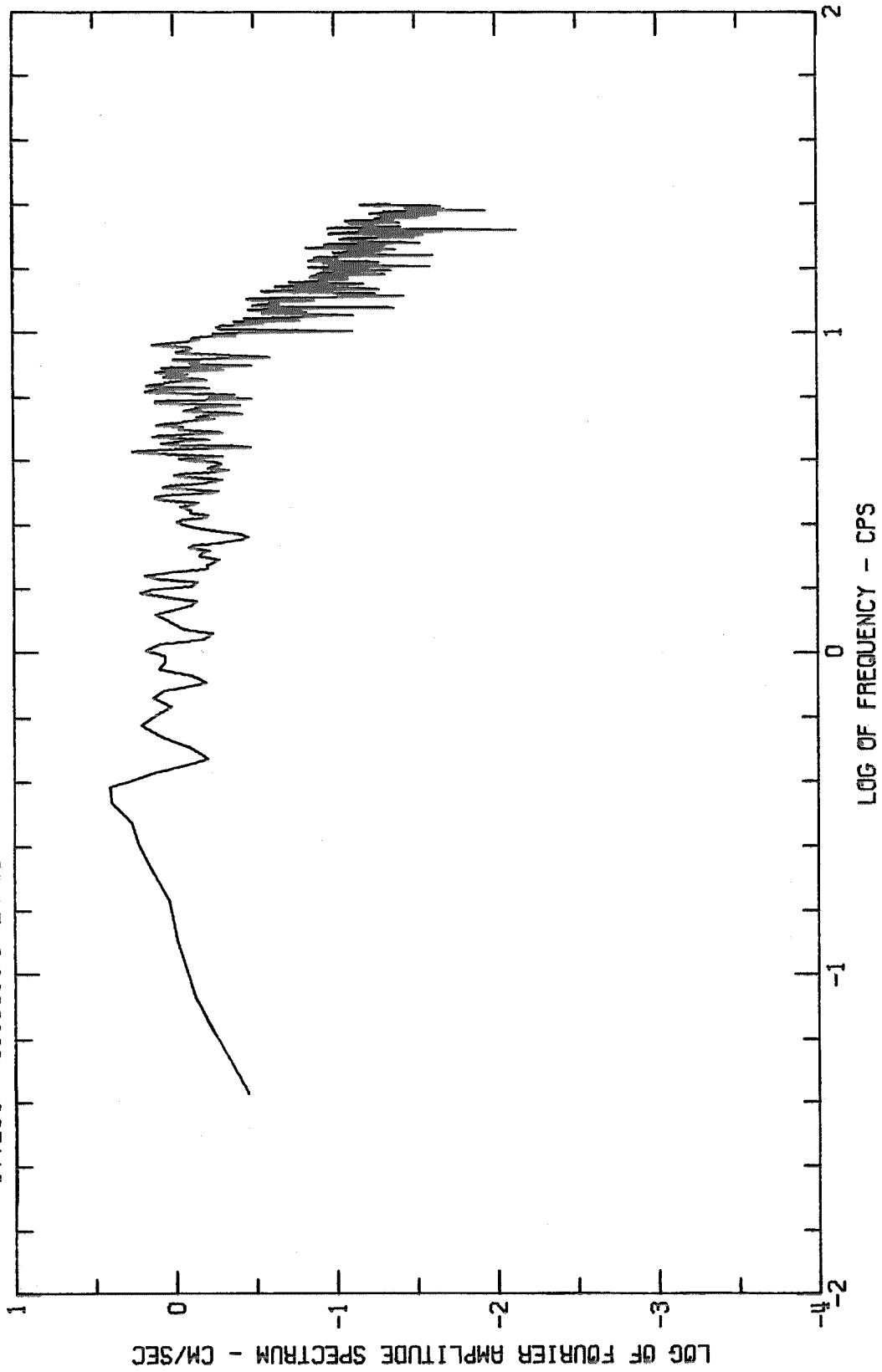


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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1VT284 40.001.8 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST

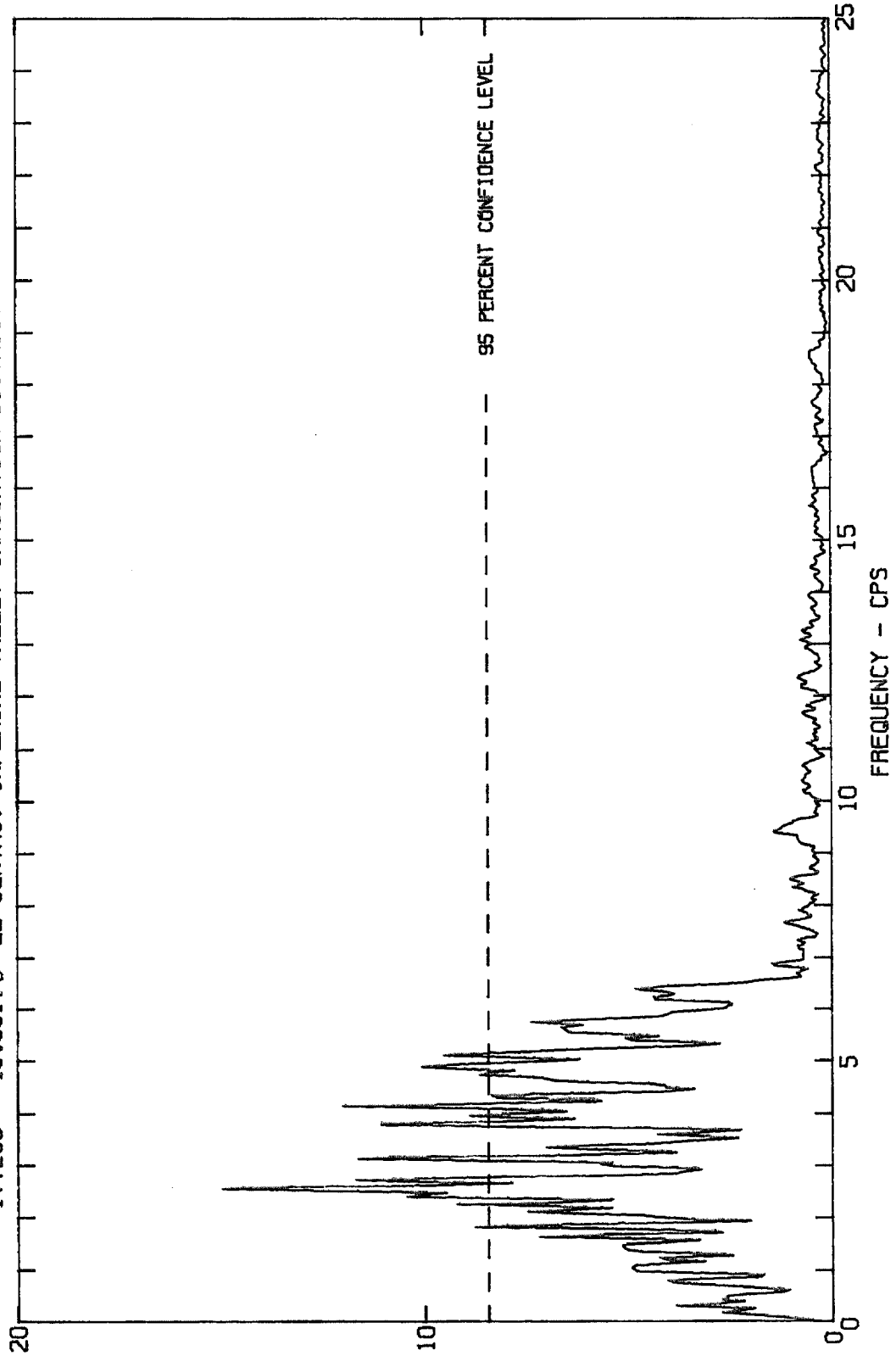




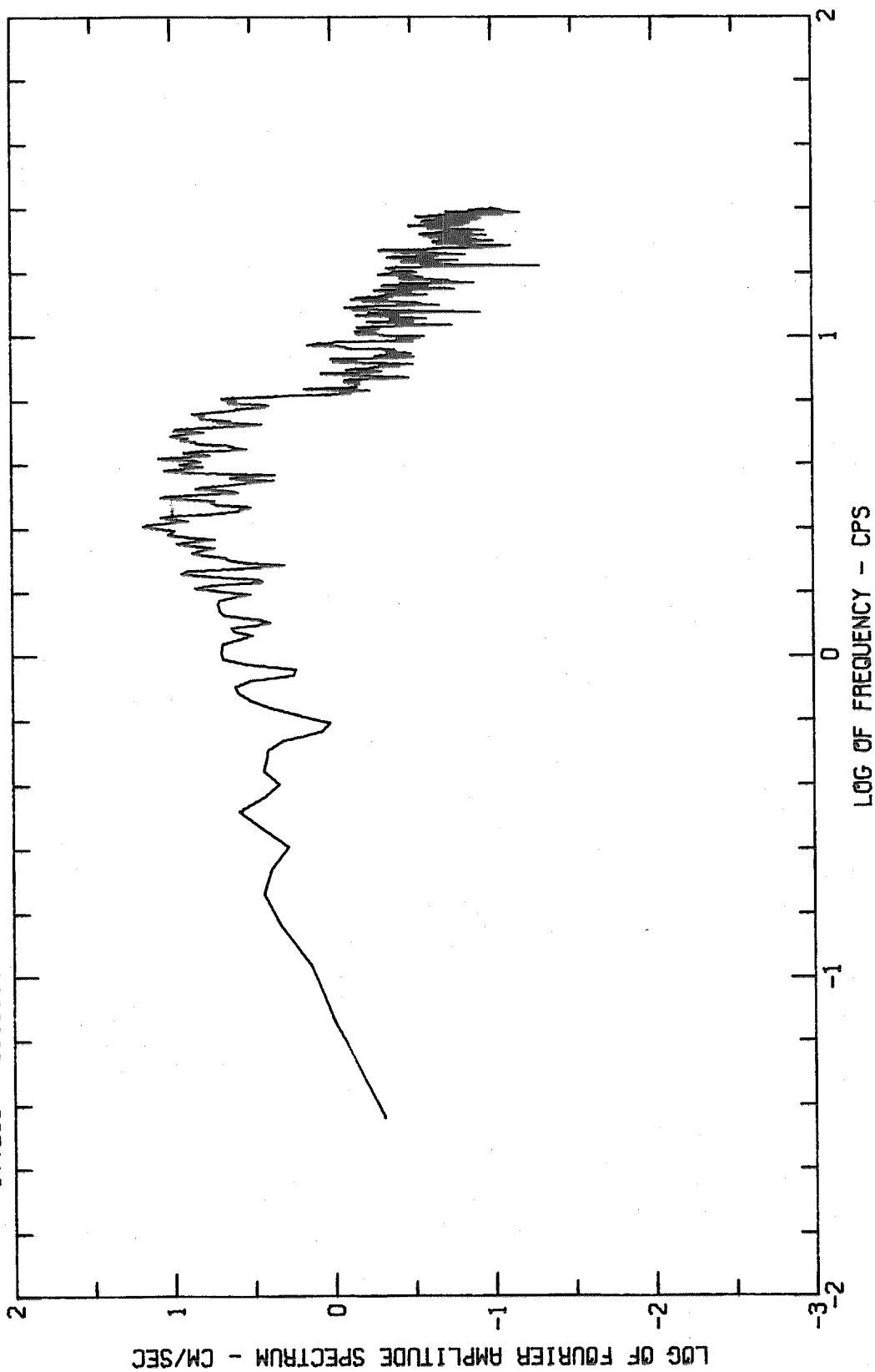
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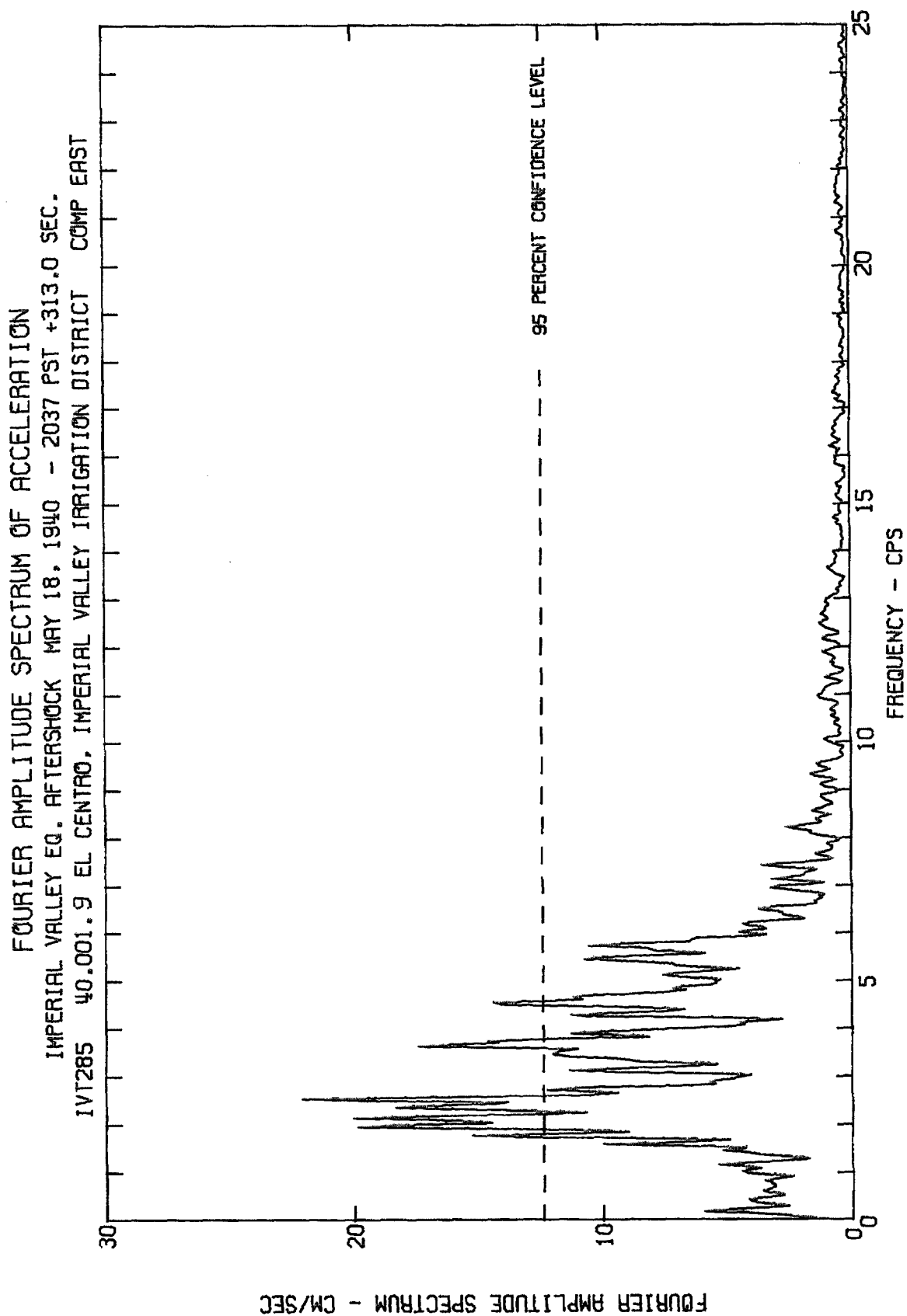


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EQ. AFTERSHOCK MAY 18, 1940 - 2037 PST +313.0 SEC.  
IVT285 40.001.9 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



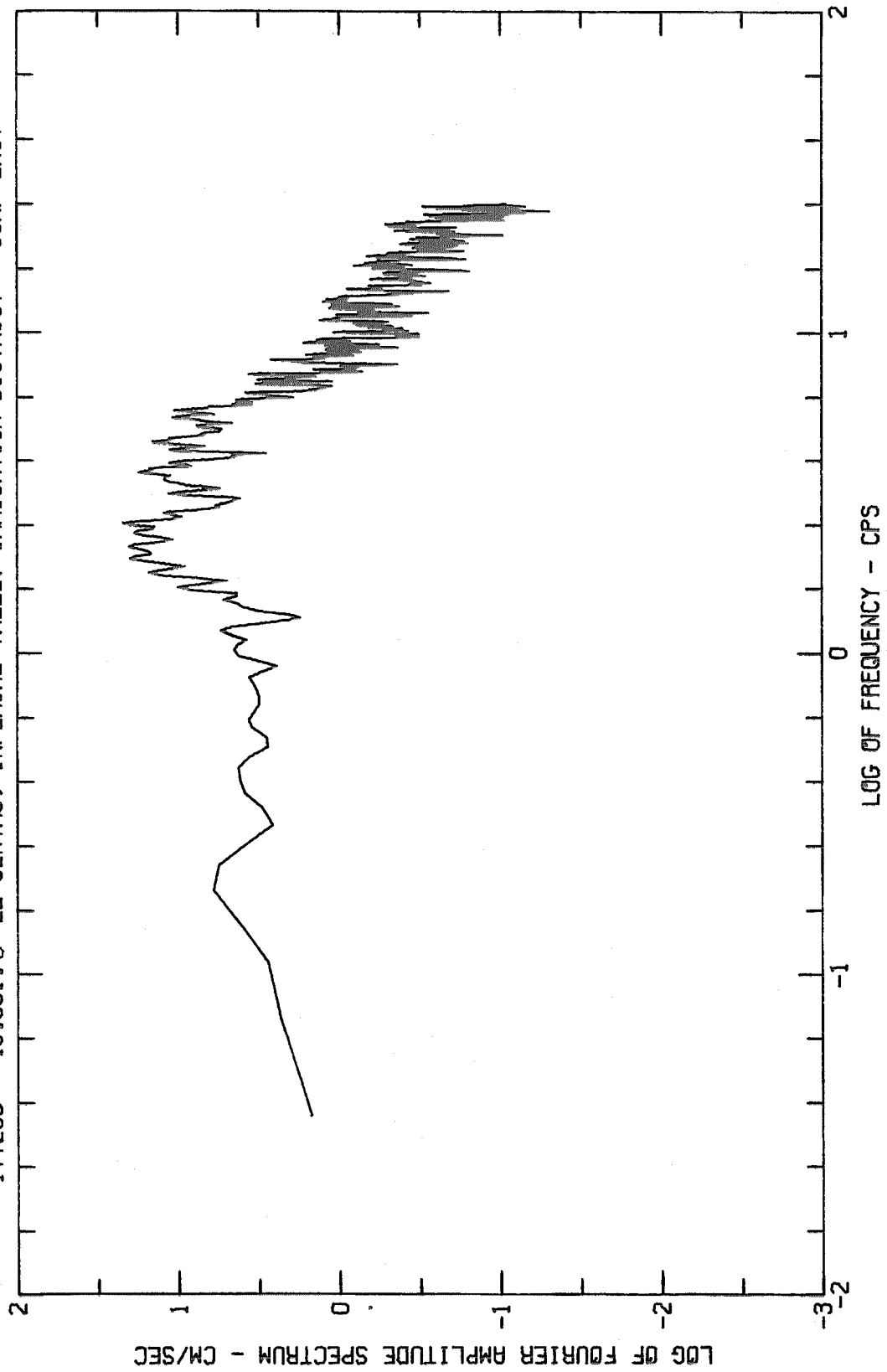
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IVT285 40.001.9 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



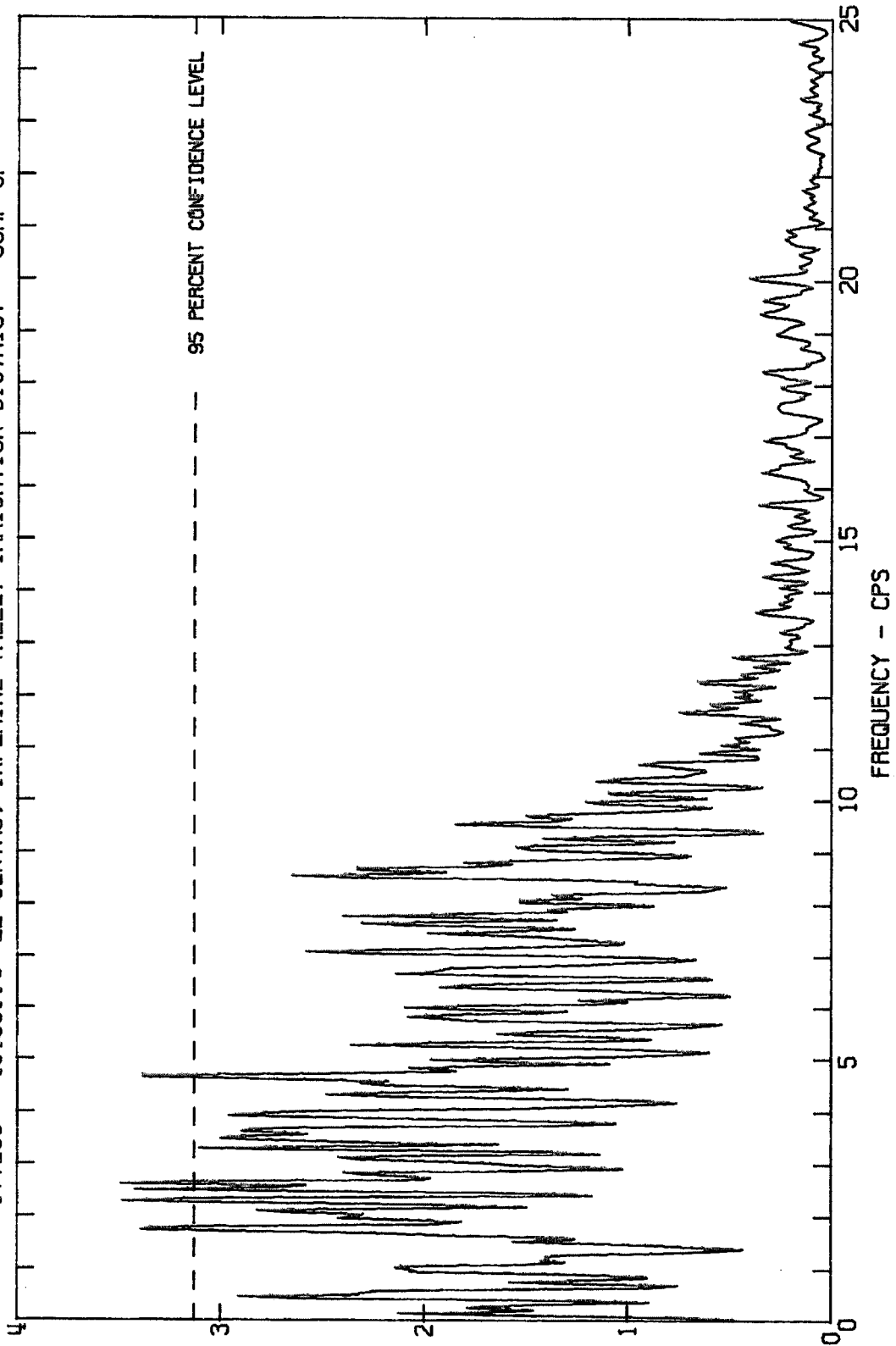




FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EQ. AFTERSHOCK MAY 18, 1940 - 2037 PST +313.0 SEC.  
1VT285 40.001.9 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST

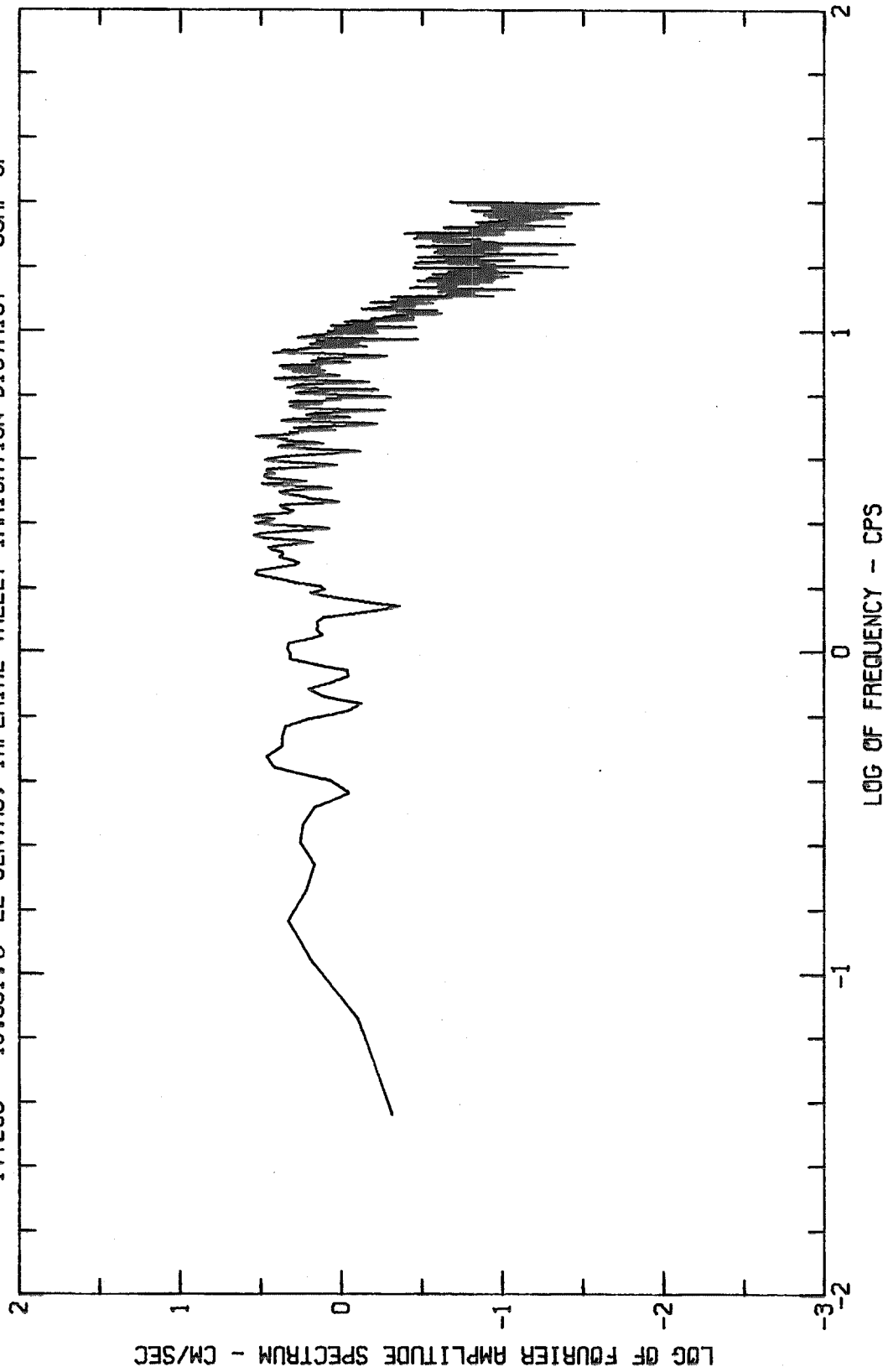


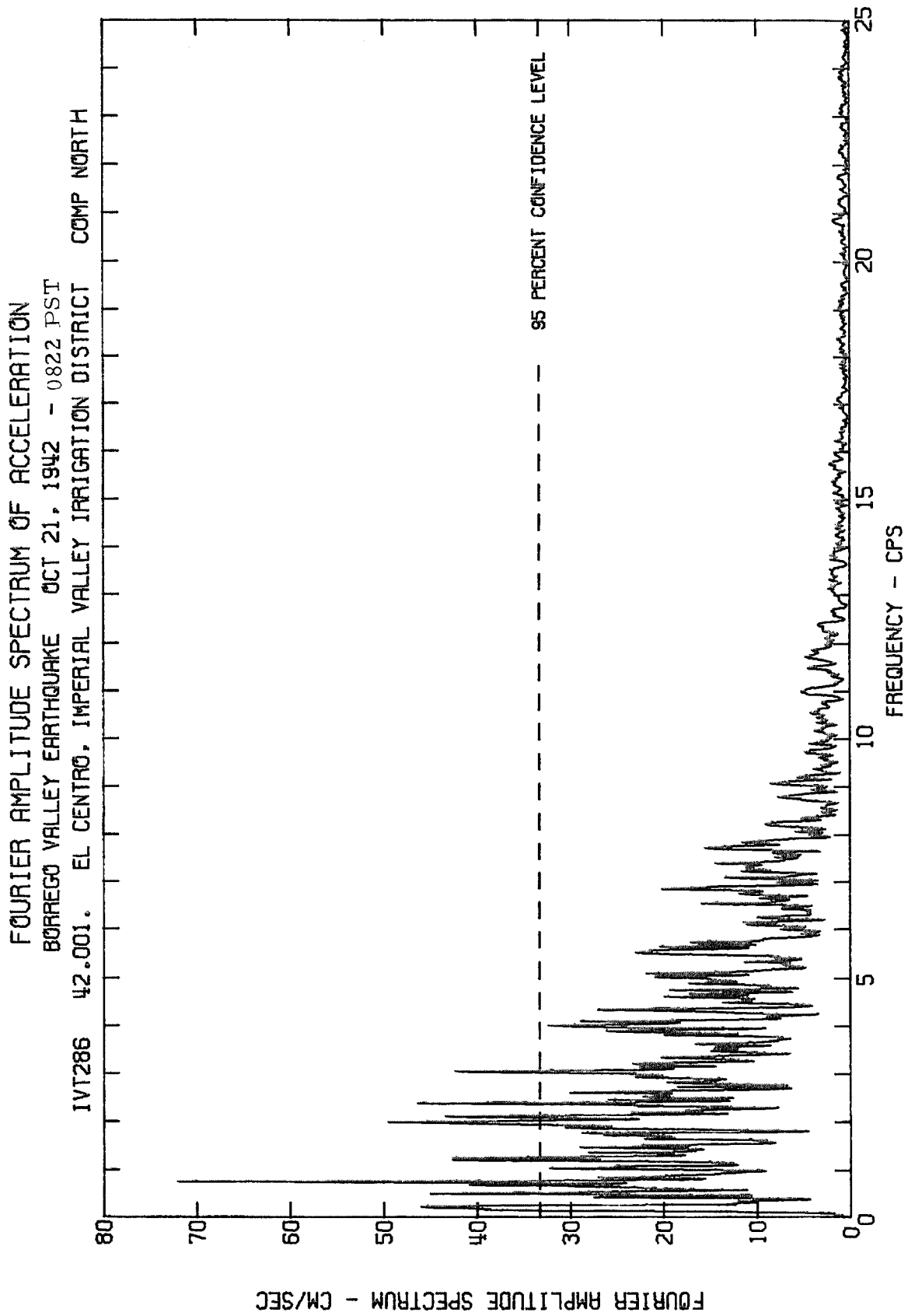
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IVT285 40.001.9 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP

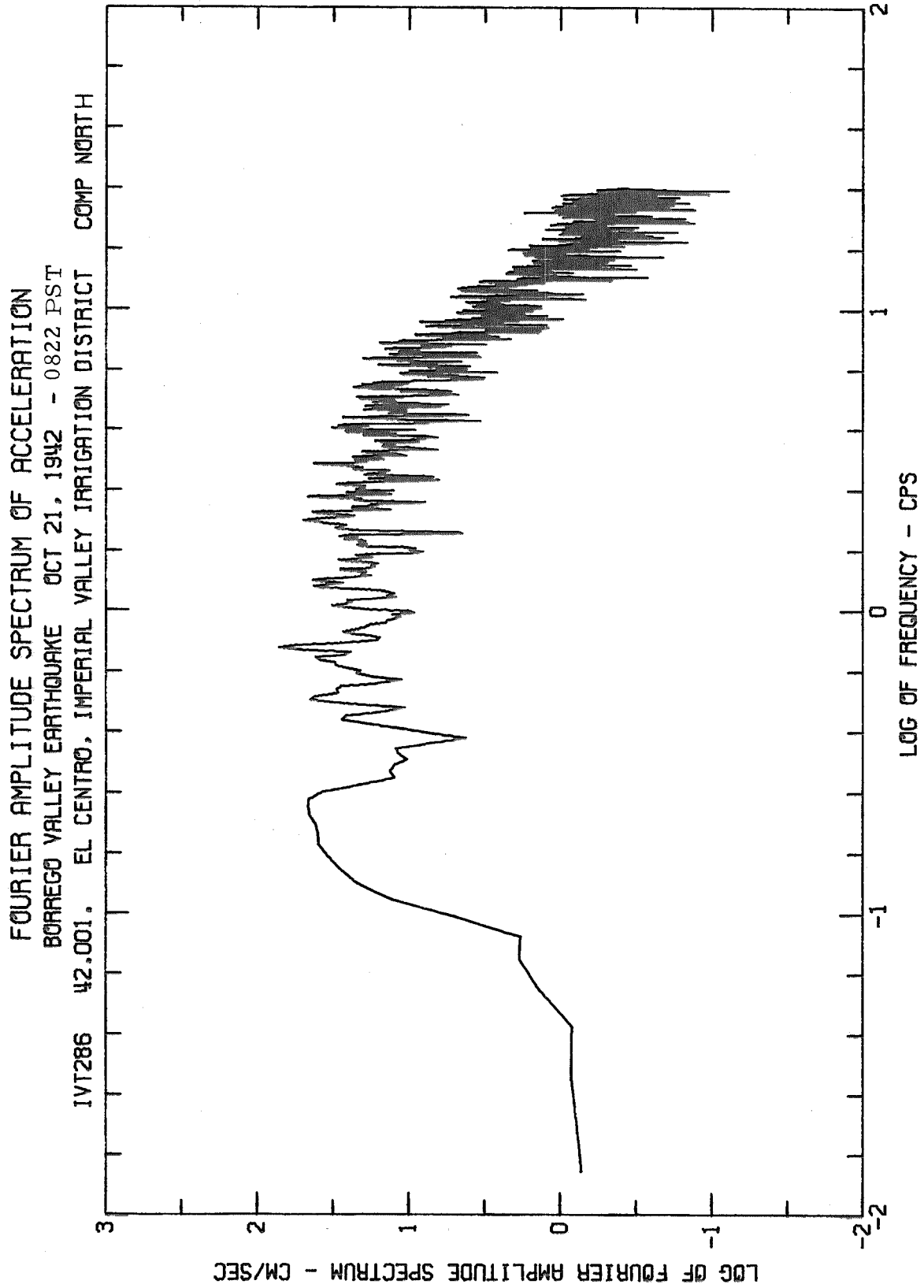


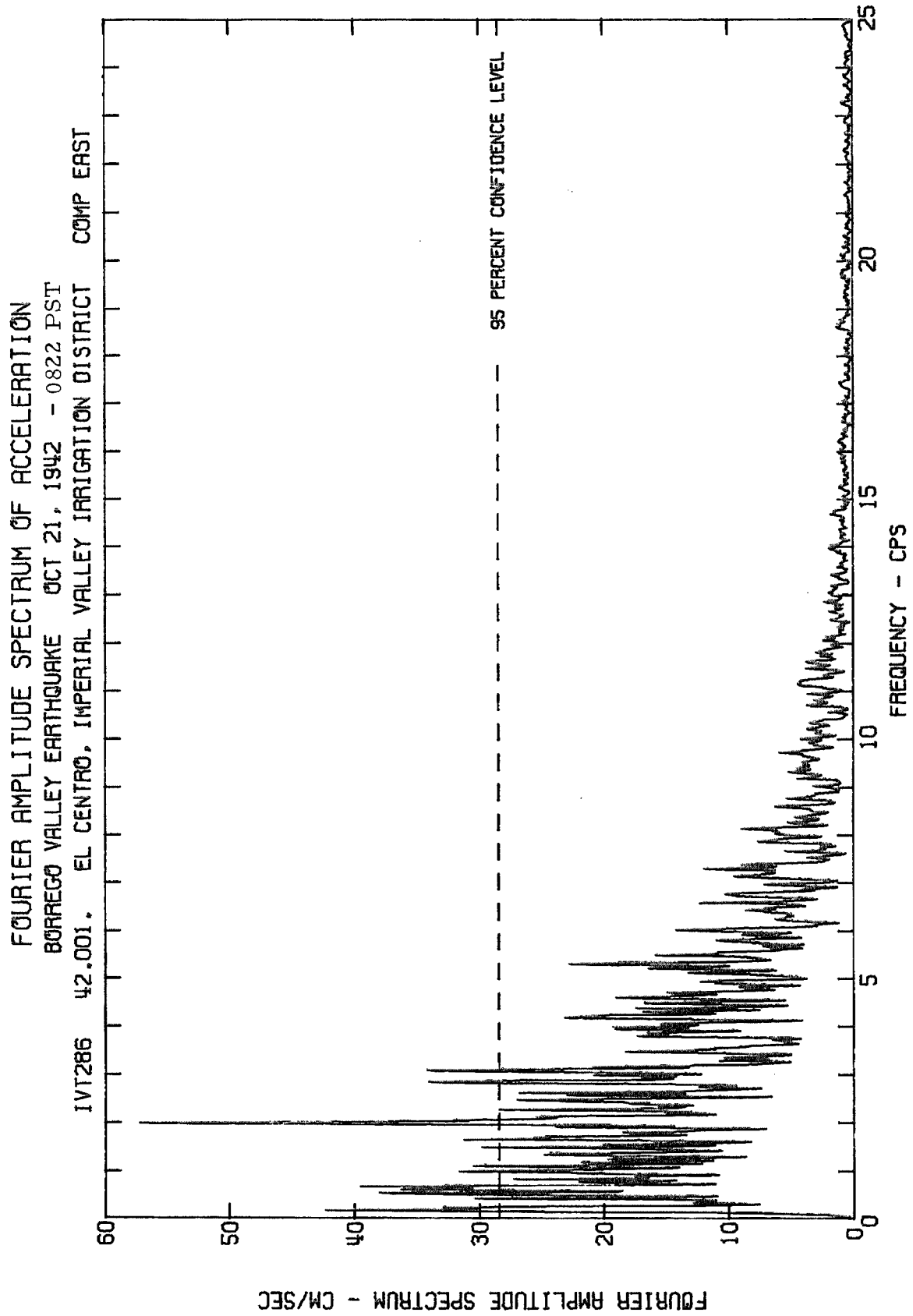
FOURIER AMPLITUDE SPECTRUM - CM/SEC

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EQ. AFTERSHOCK MAY 18, 1940 - 2037 PST +313.0 SEC.  
1VT285 40.001.9 EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP

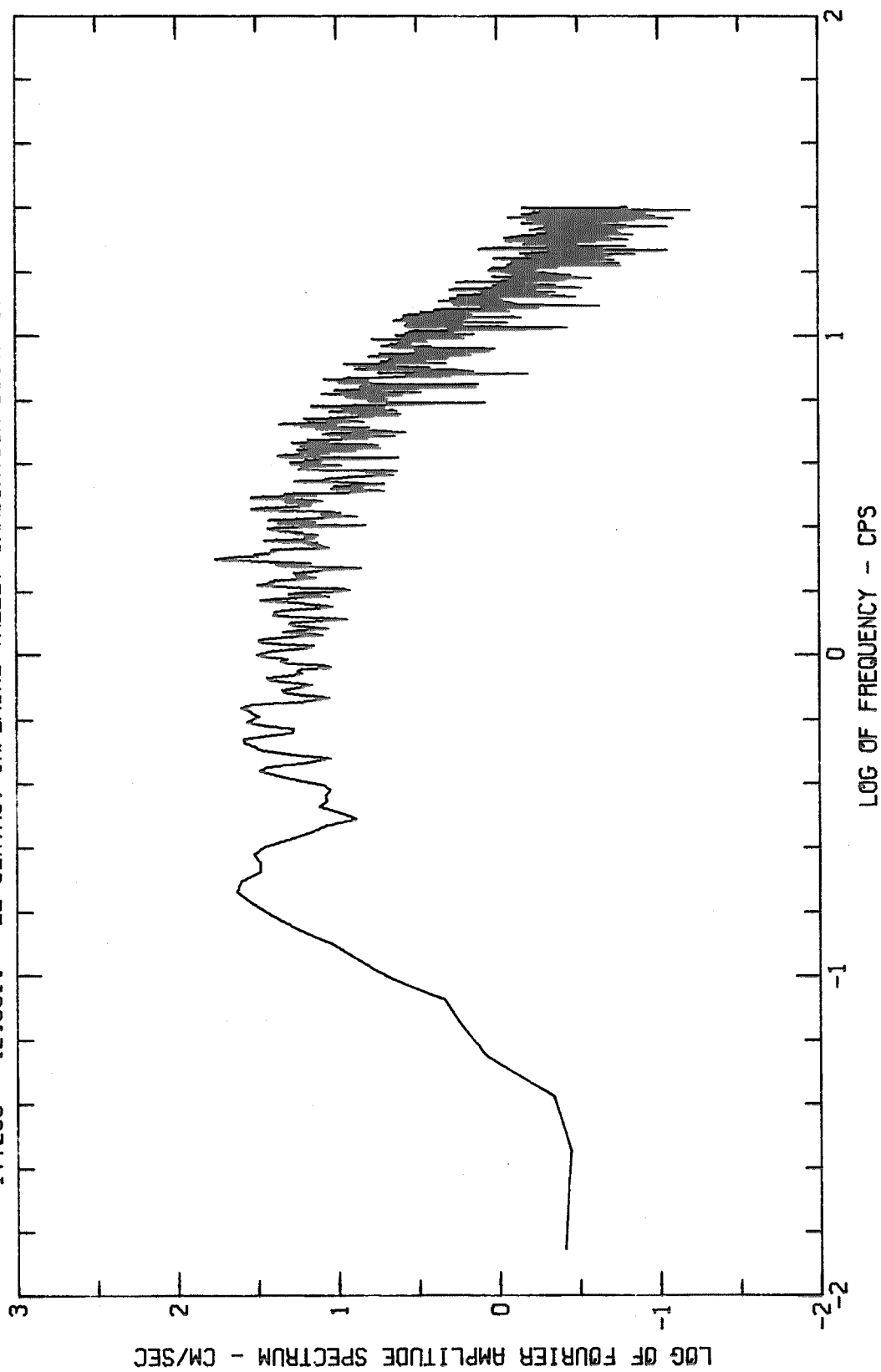


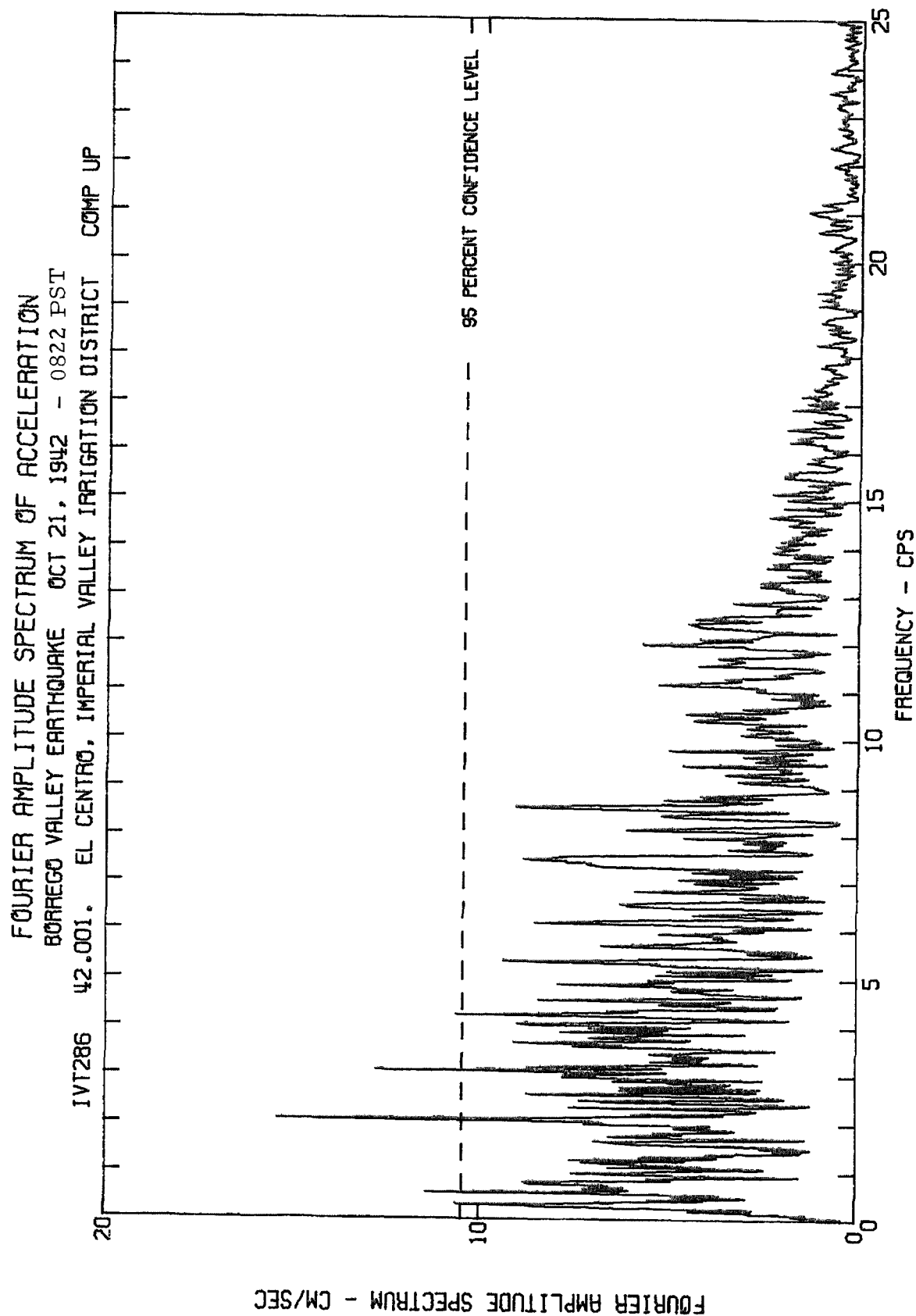






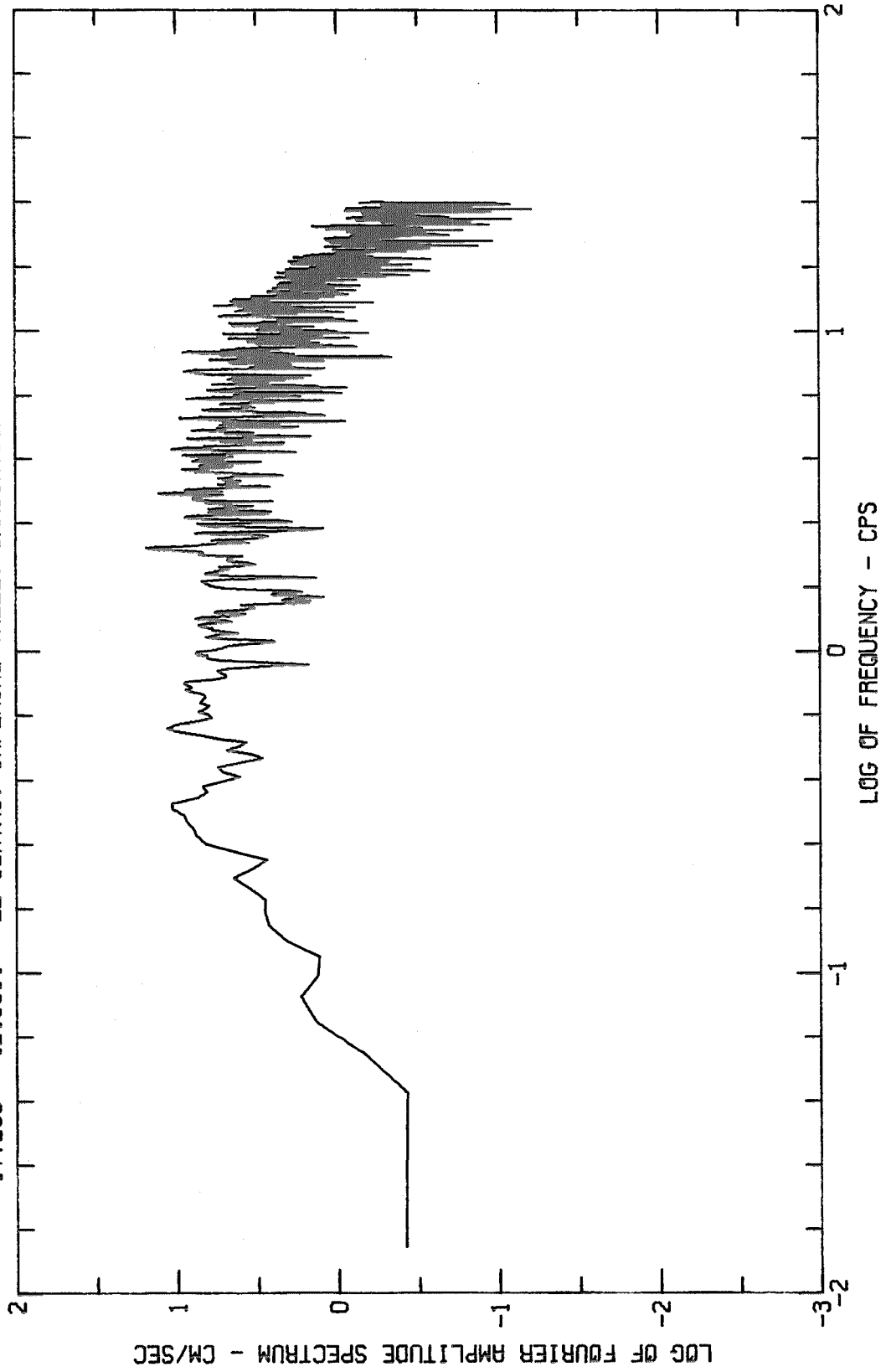
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
BORRERO VALLEY EARTHQUAKE OCT 21, 1942 - 0822 PST  
IVT286 42.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST

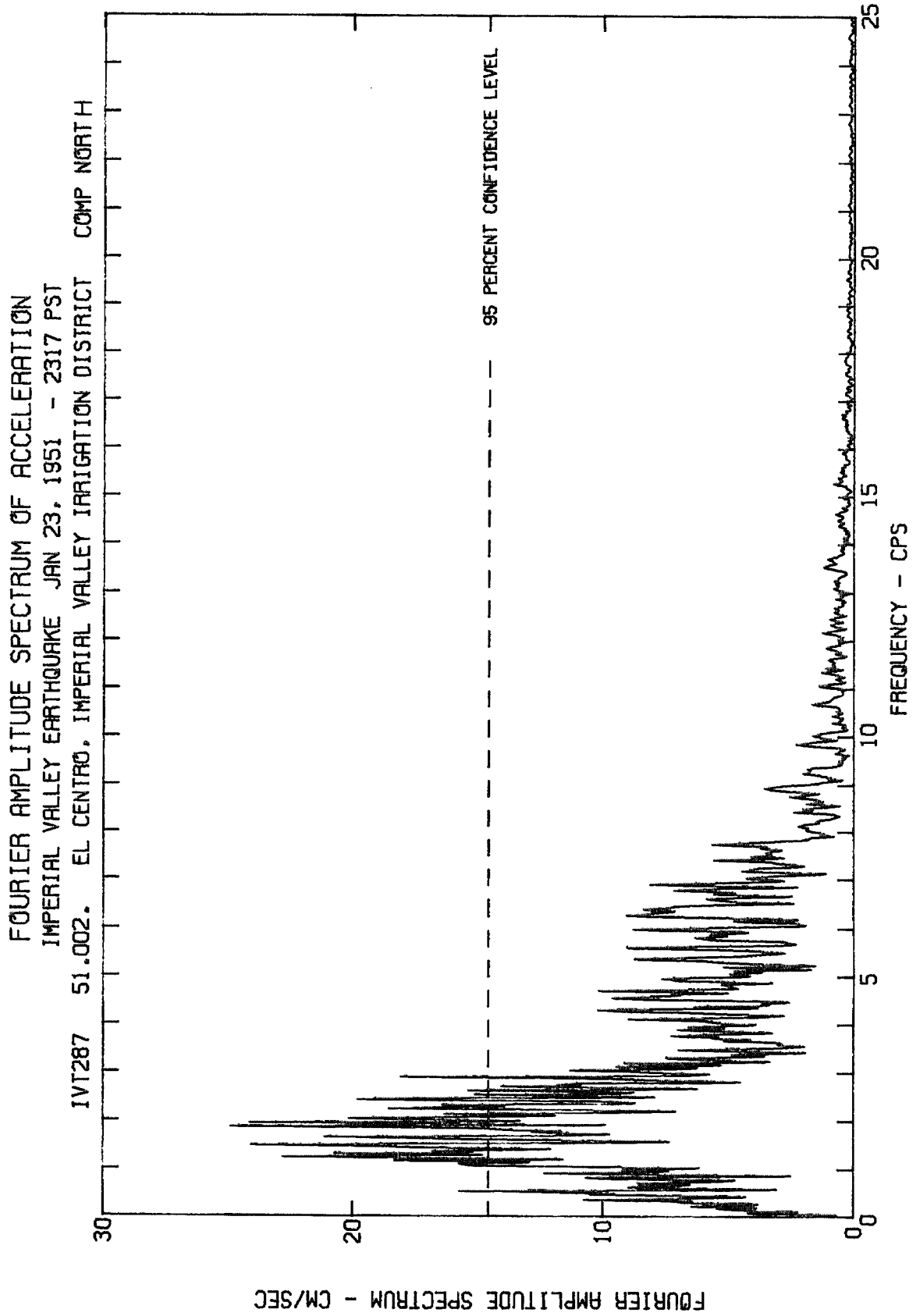




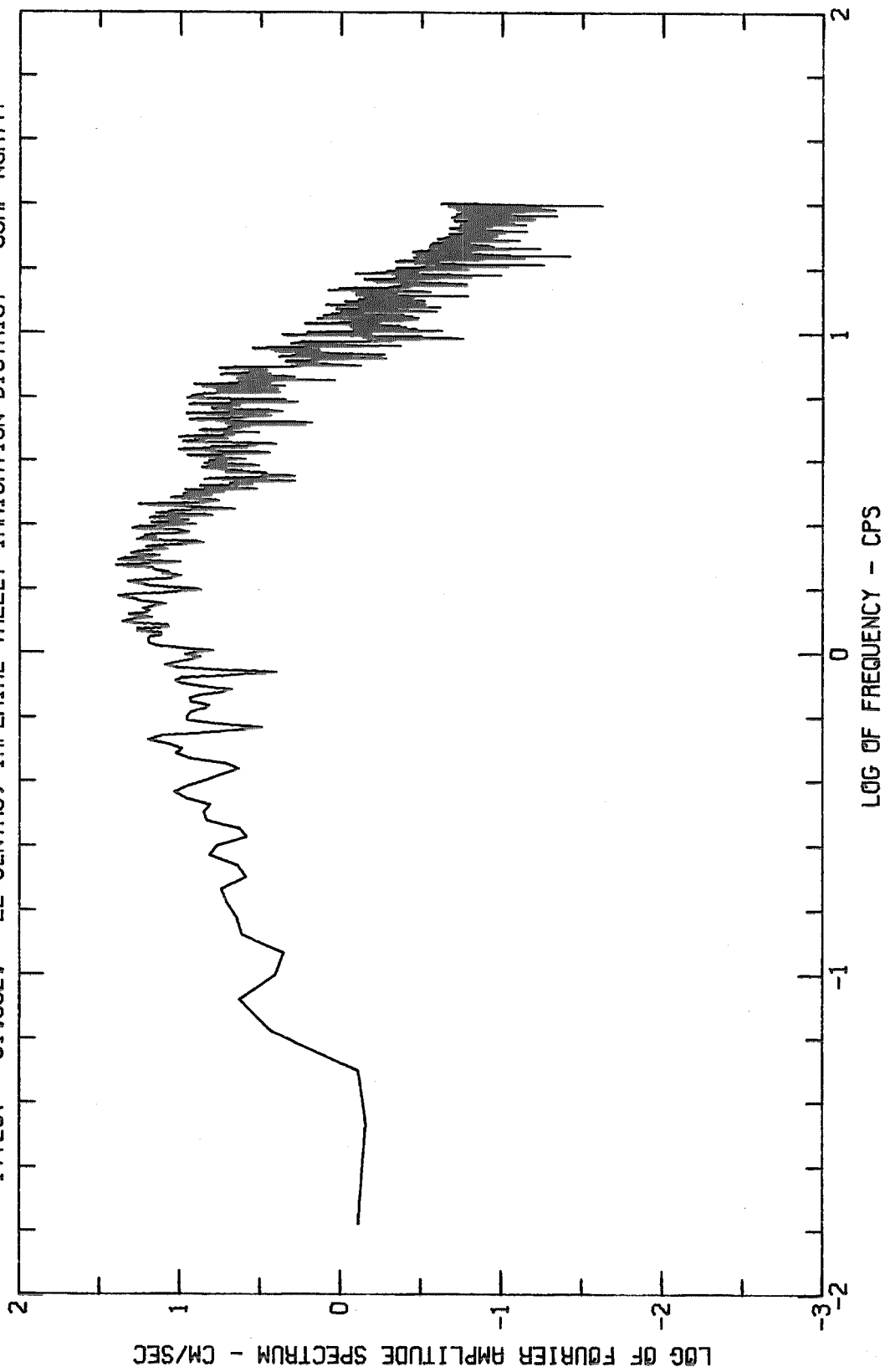


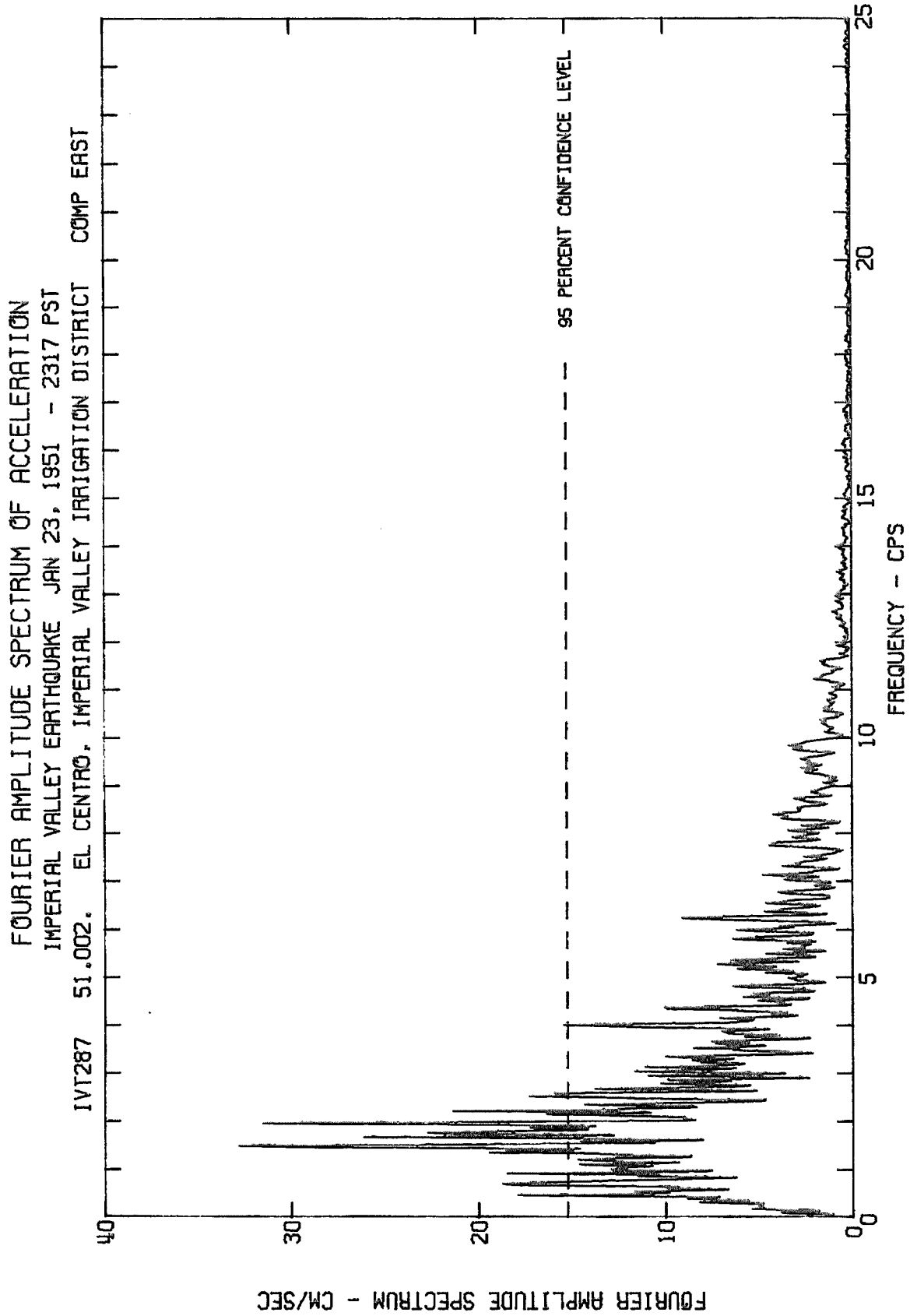
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
BORREGO VALLEY EARTHQUAKE OCT 21, 1942 - 0822 PST  
IVT286 42.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP

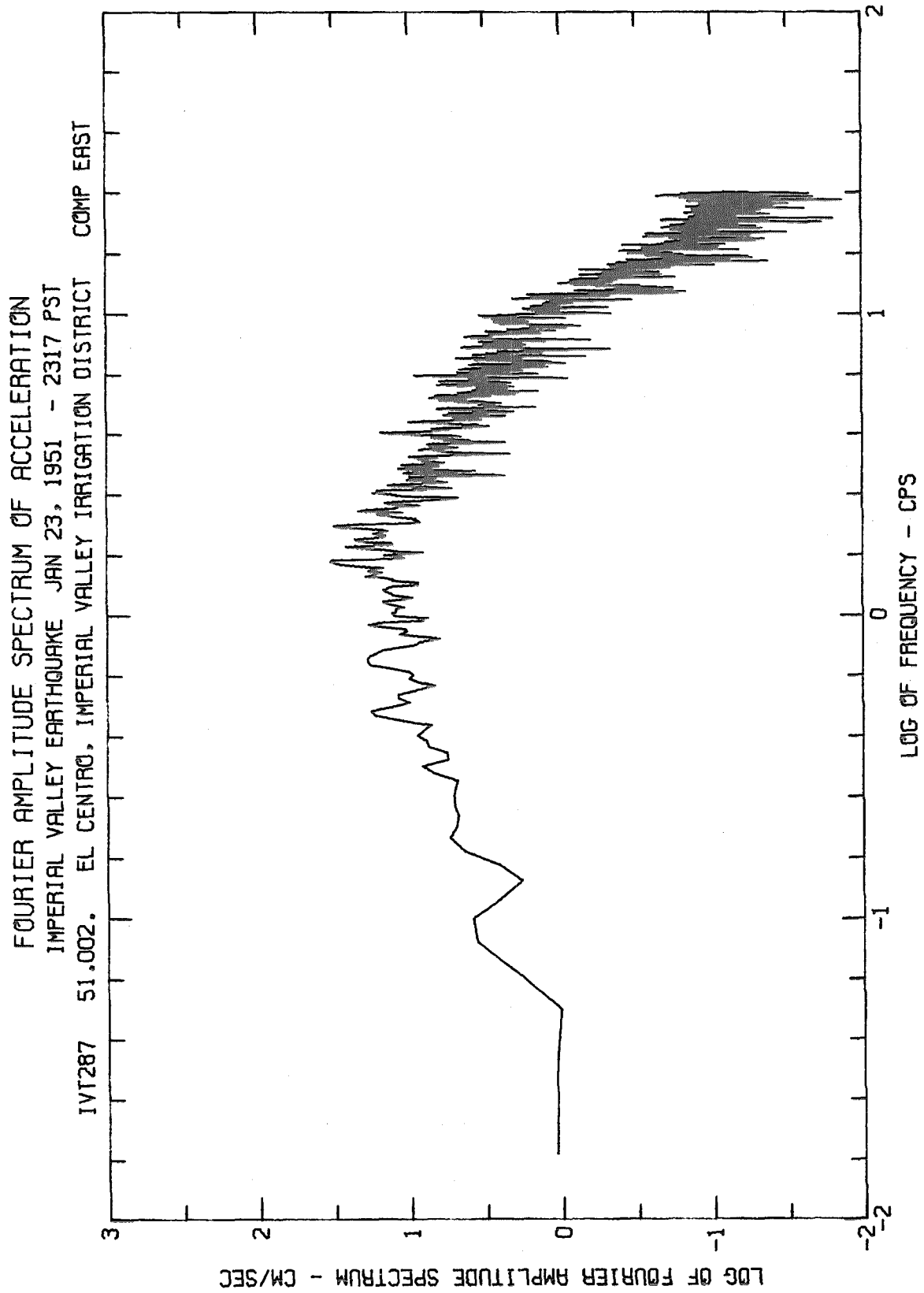


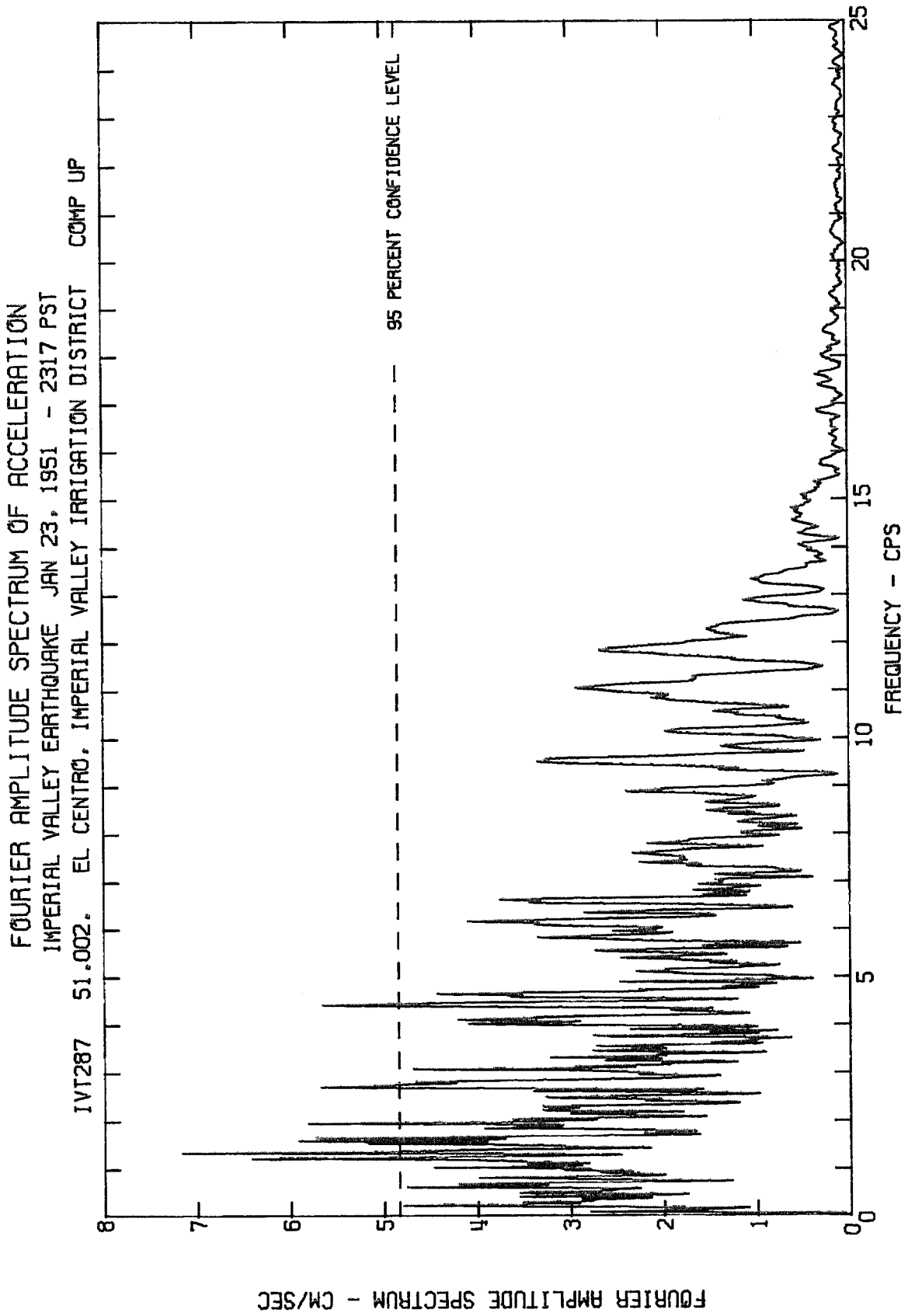


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EARTHQUAKE JAN 23, 1951 - 2317 PST  
IVT287 51.002, EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH

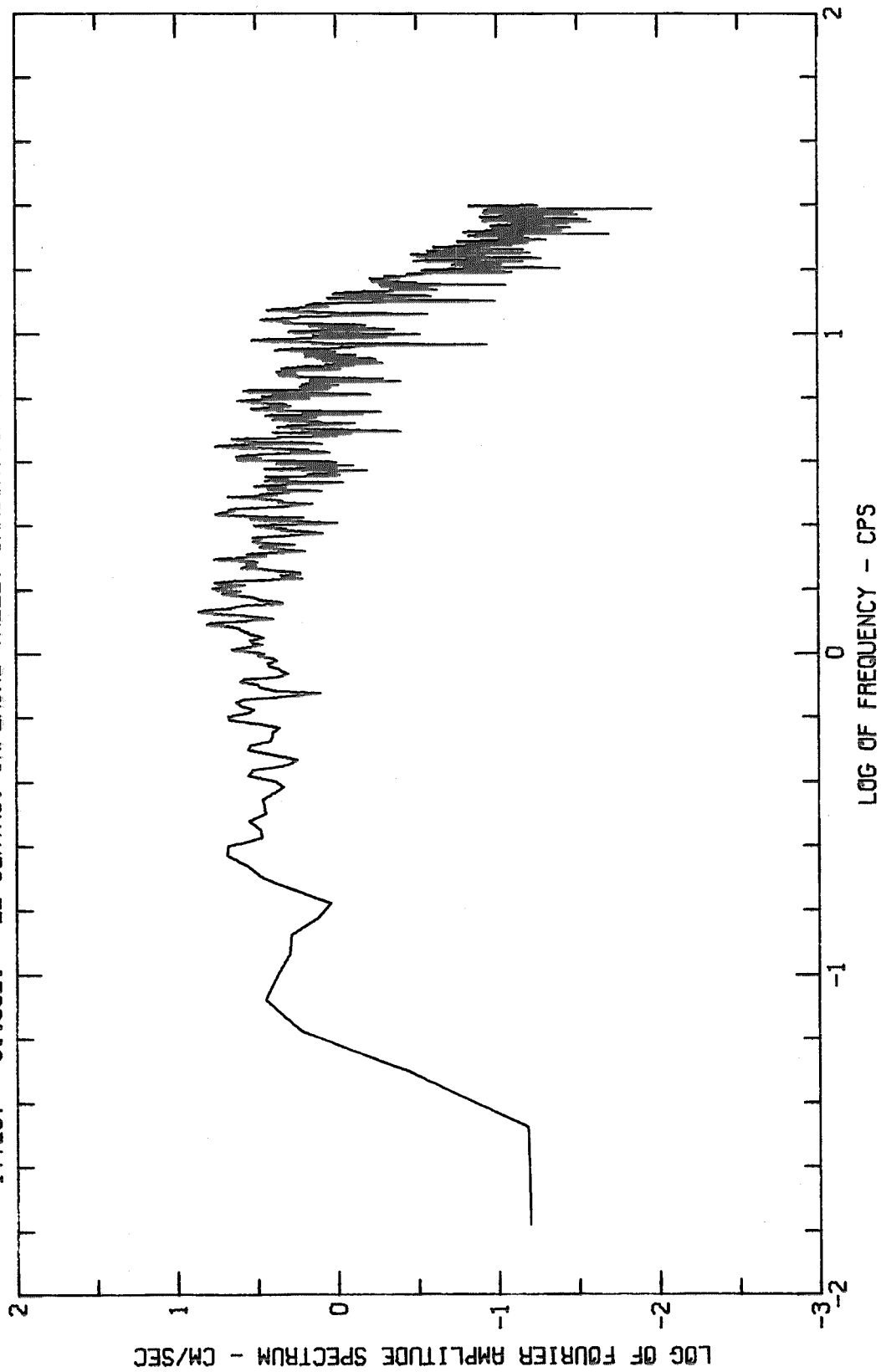


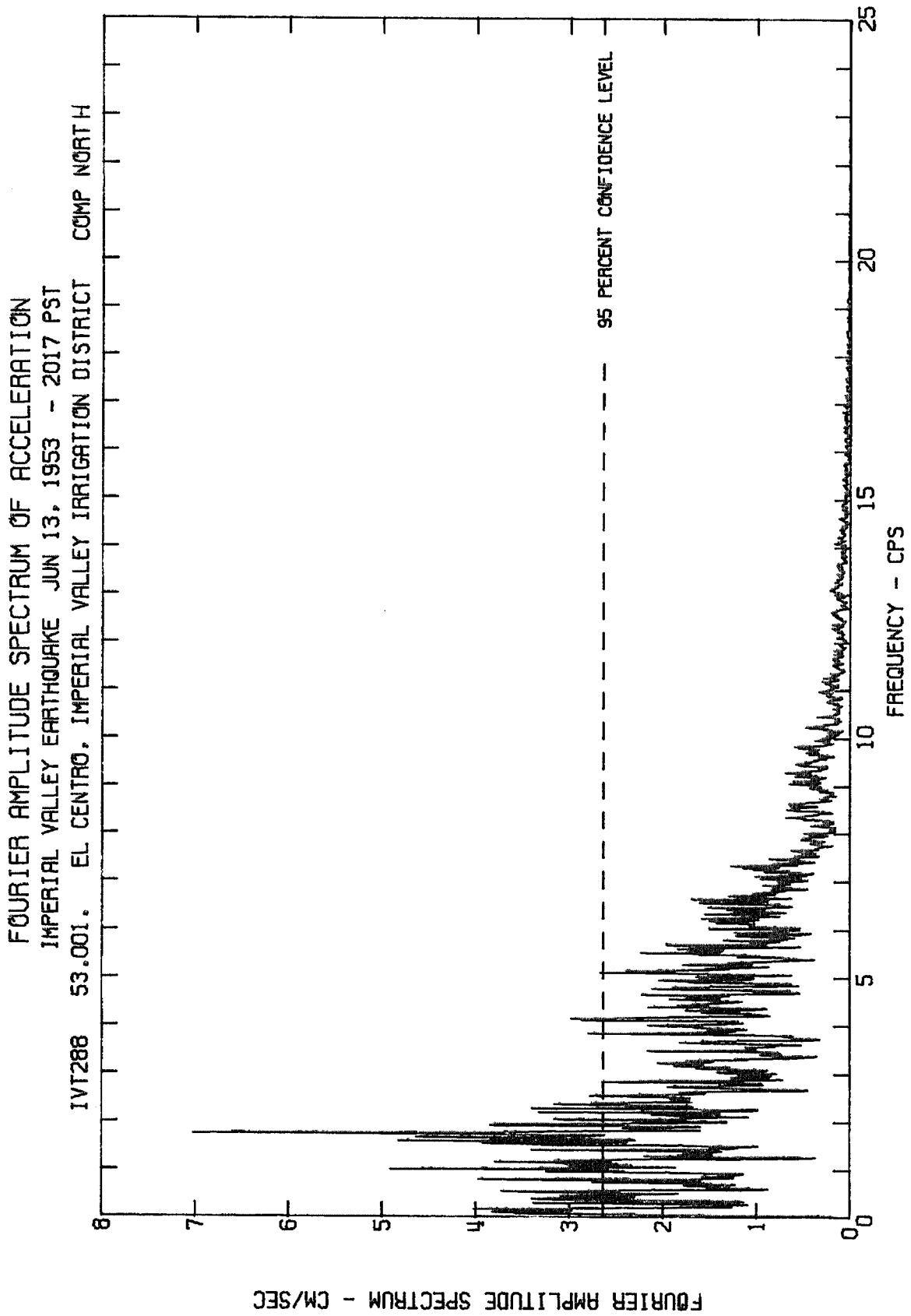






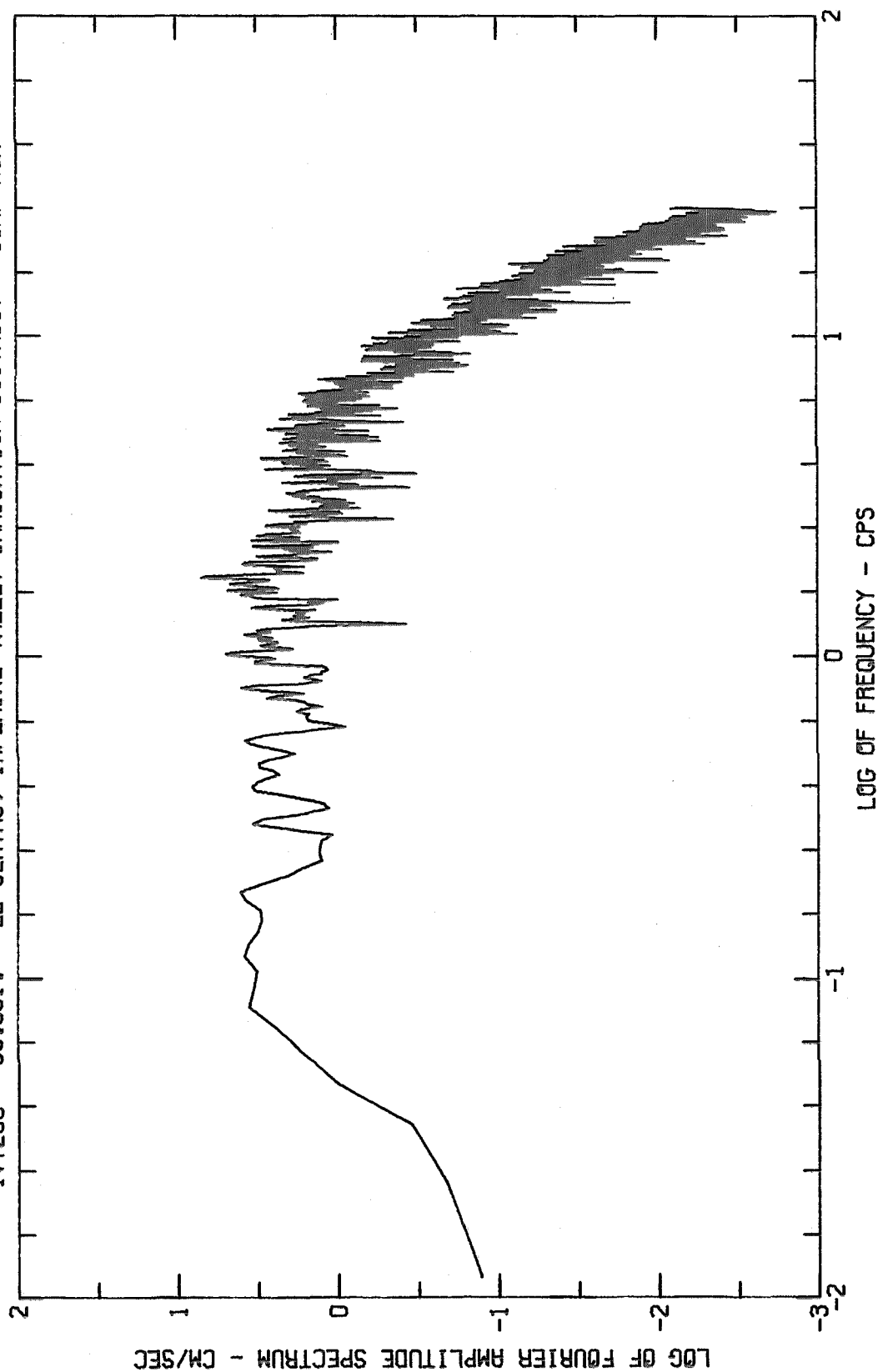
IVT287 51.002. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP  
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EARTHQUAKE JAN 23, 1951 - 2317 PST

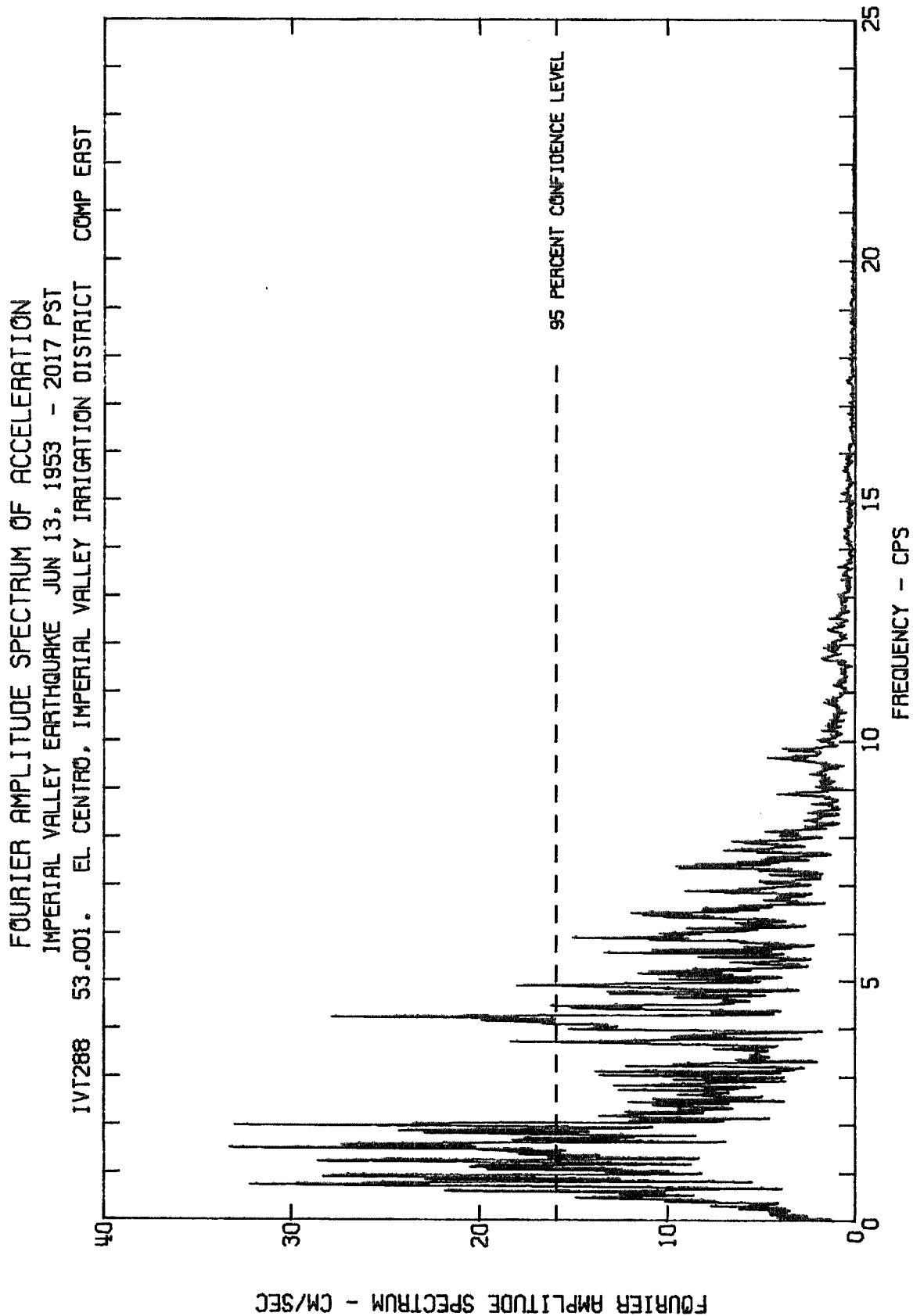




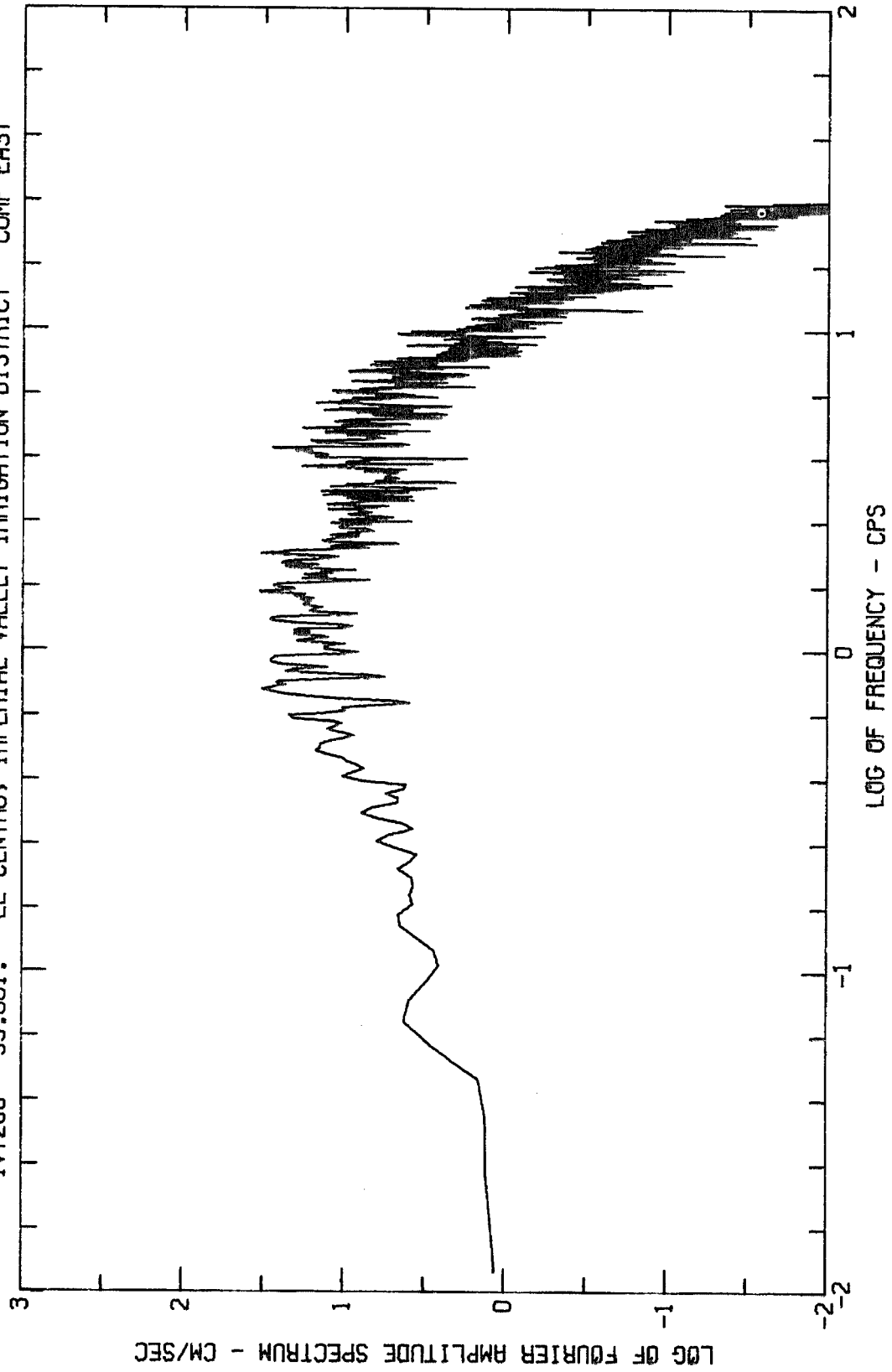


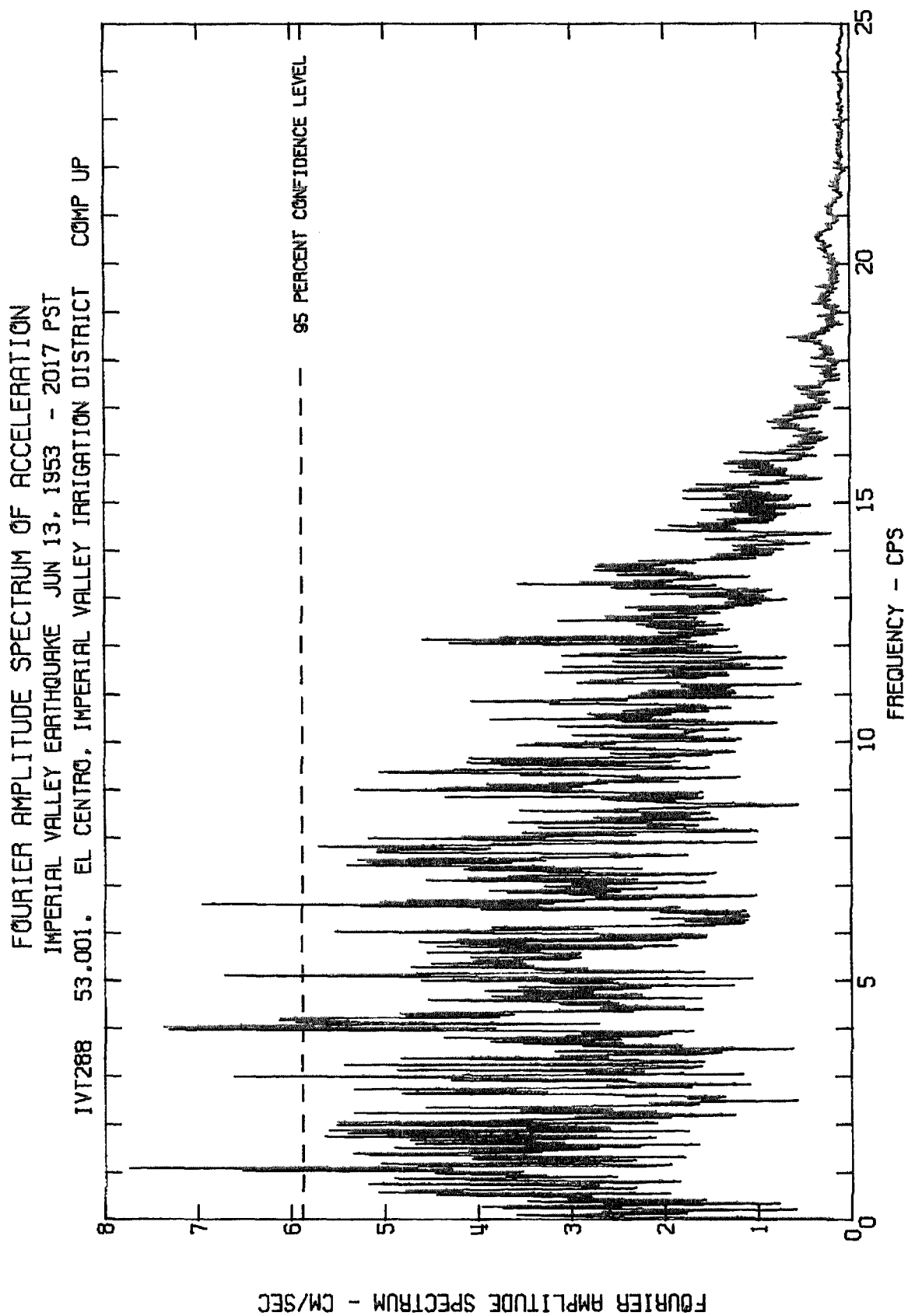
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EARTHQUAKE JUN 13, 1953 - 2017 PST  
1VT288 53.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



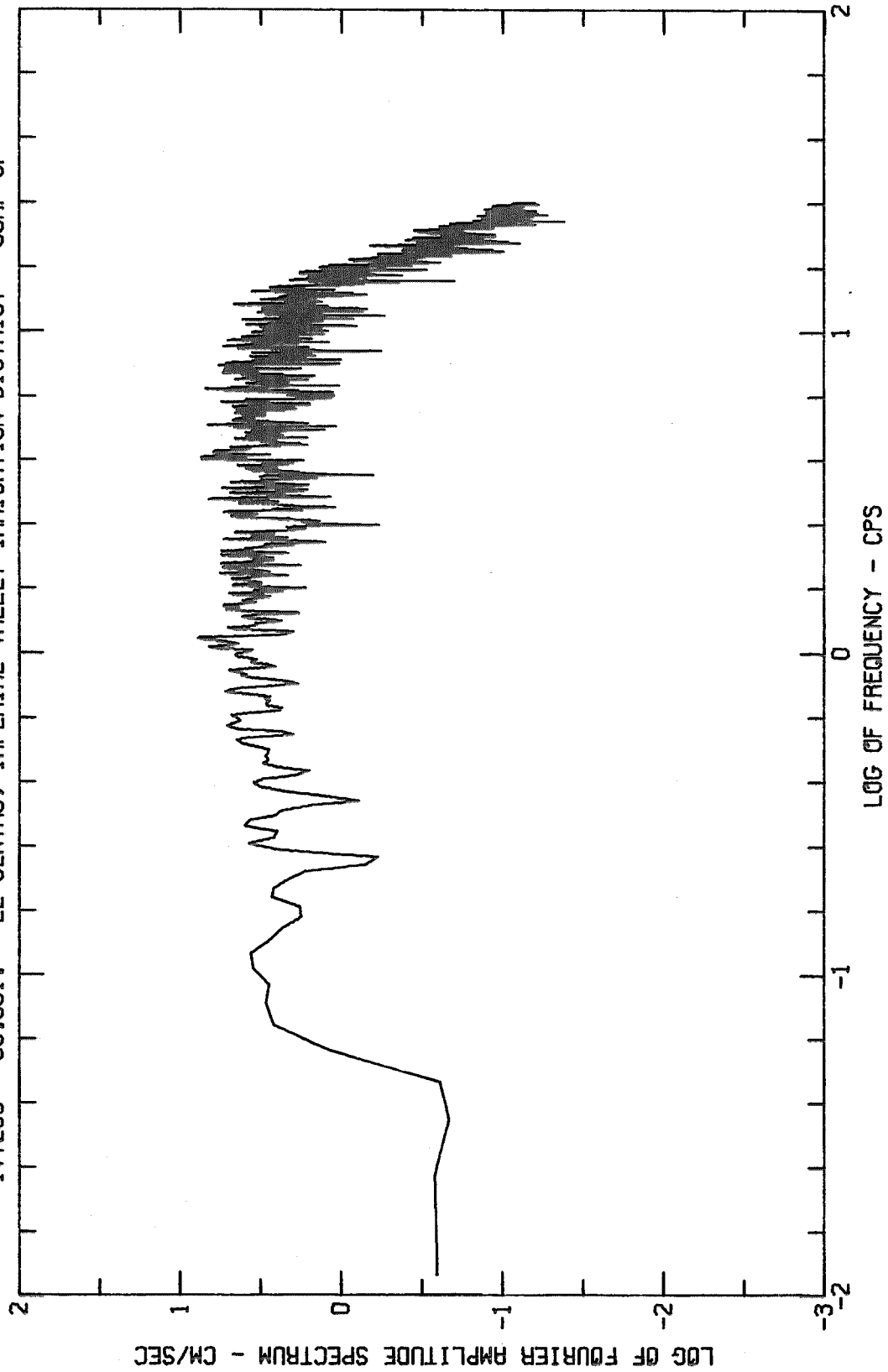


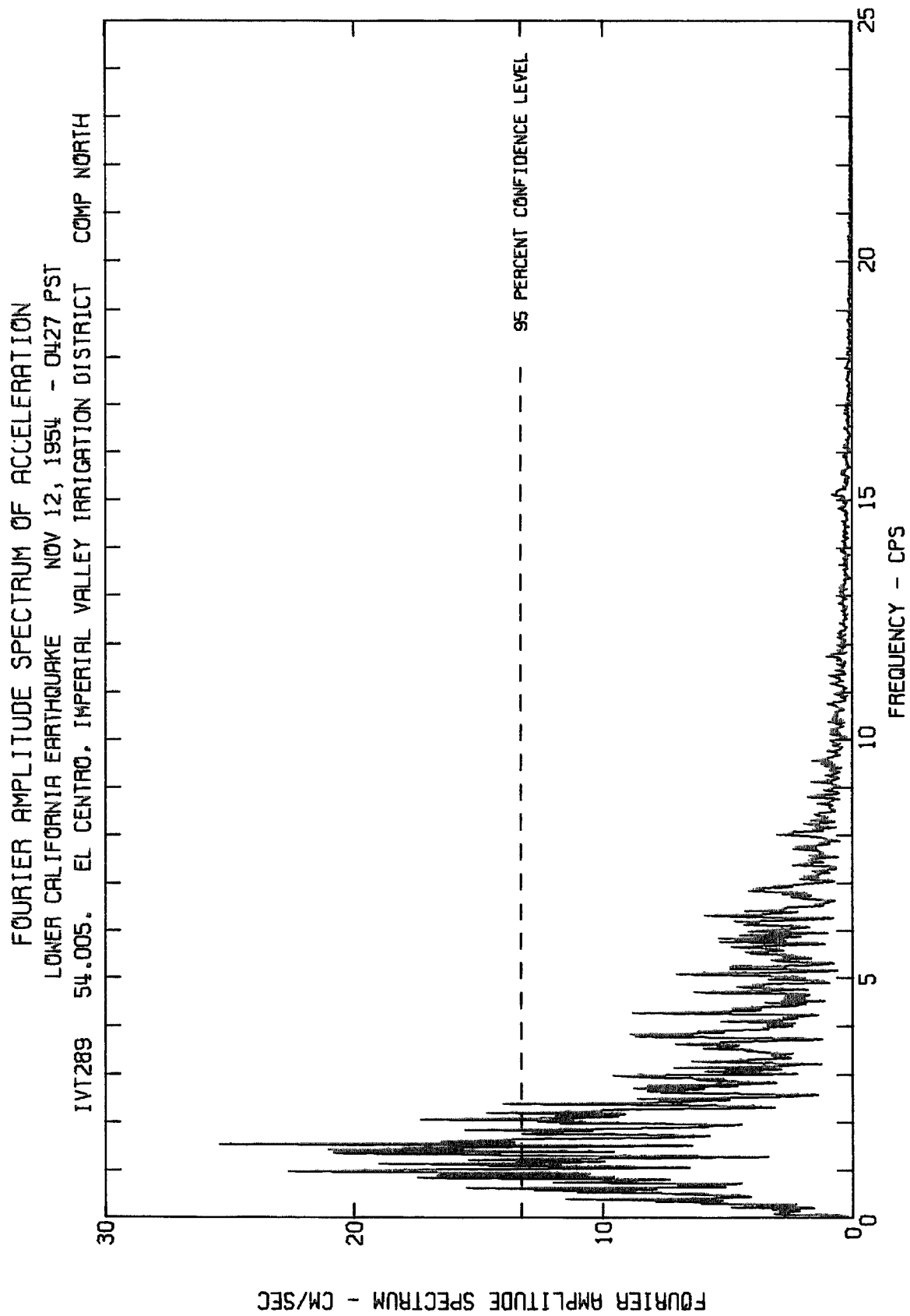
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IMPERIAL VALLEY EARTHQUAKE JUN 13, 1953 - 2017 PST  
1VT288 53.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST



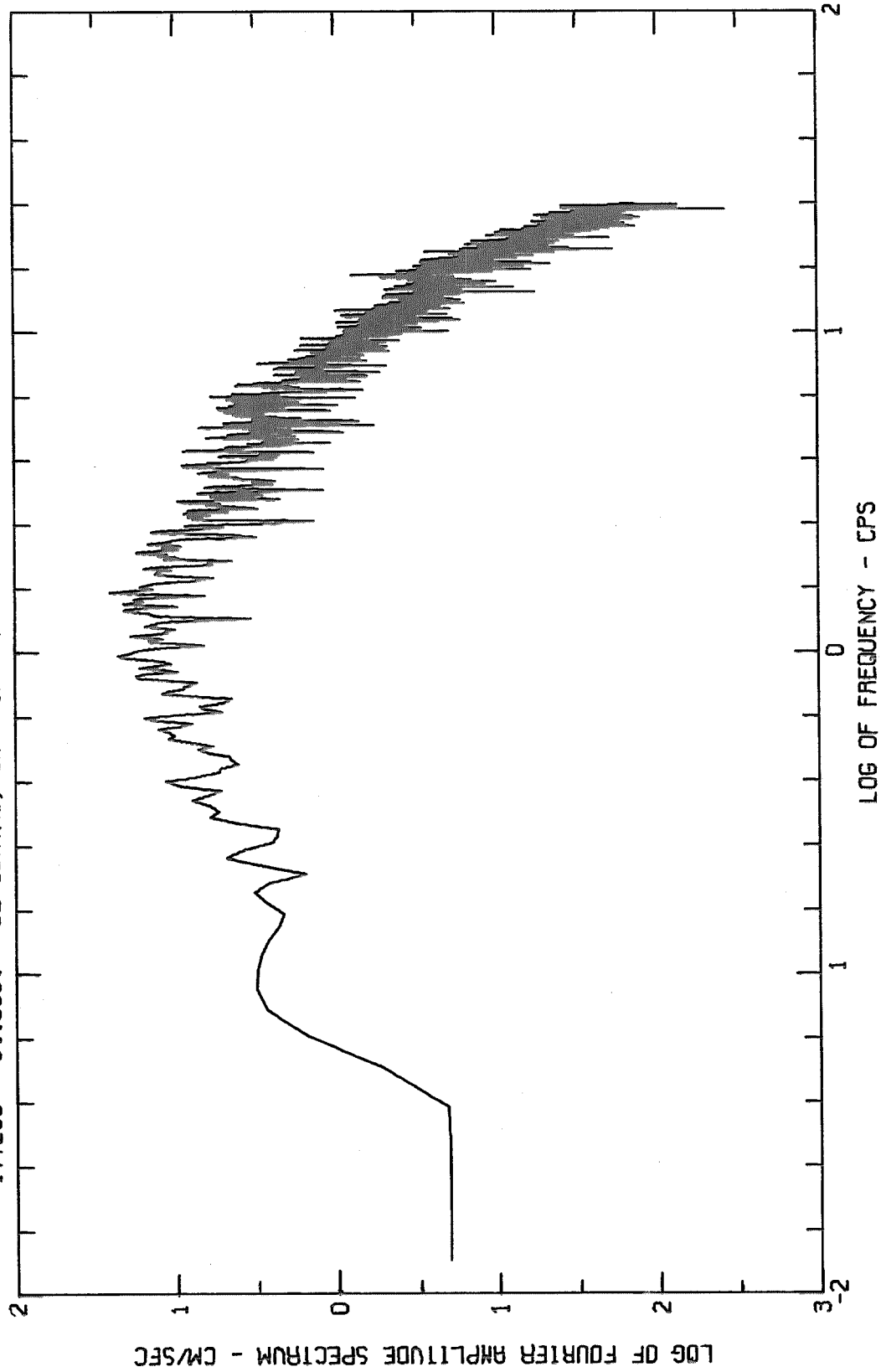


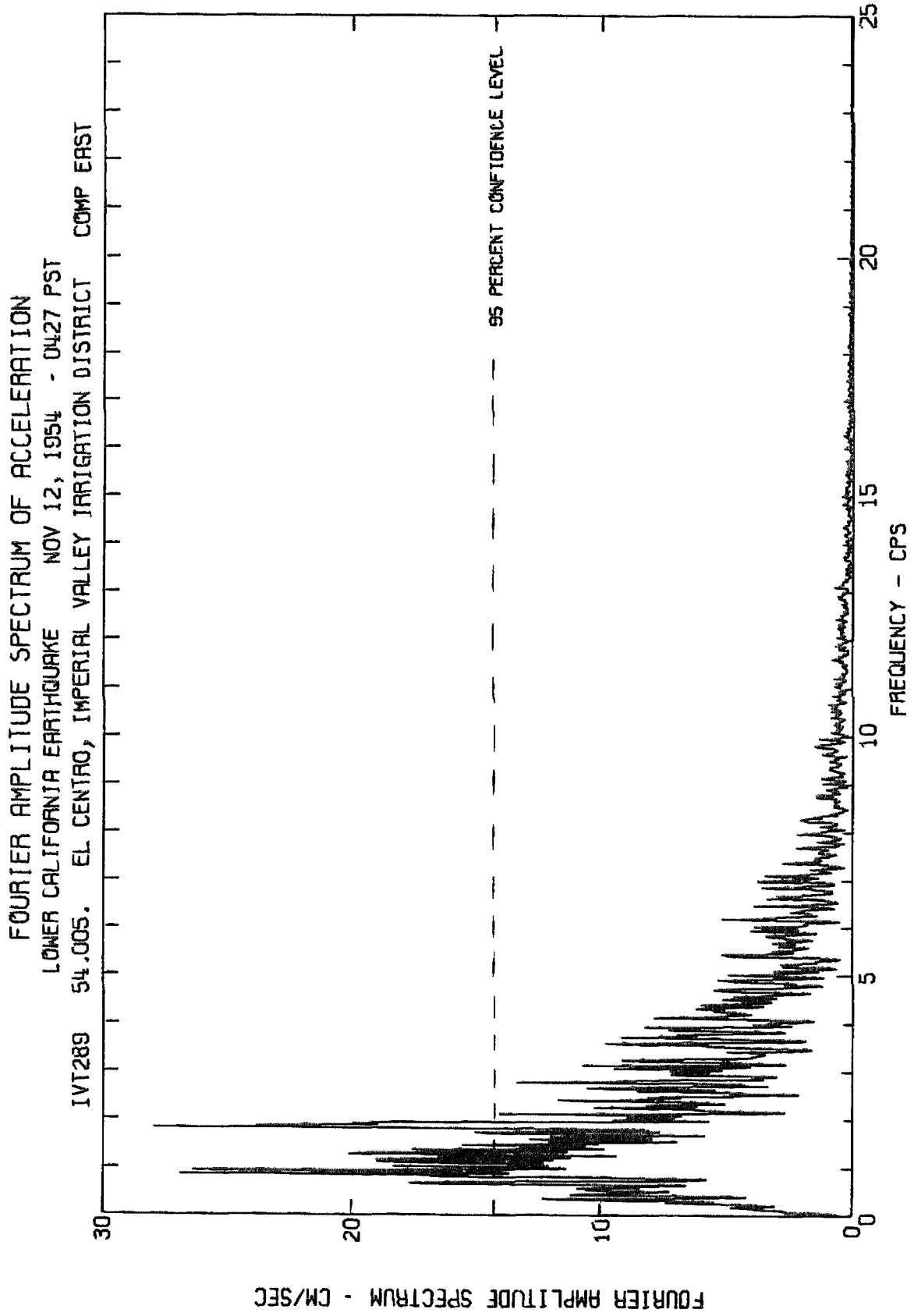
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IVT288 53.001. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP





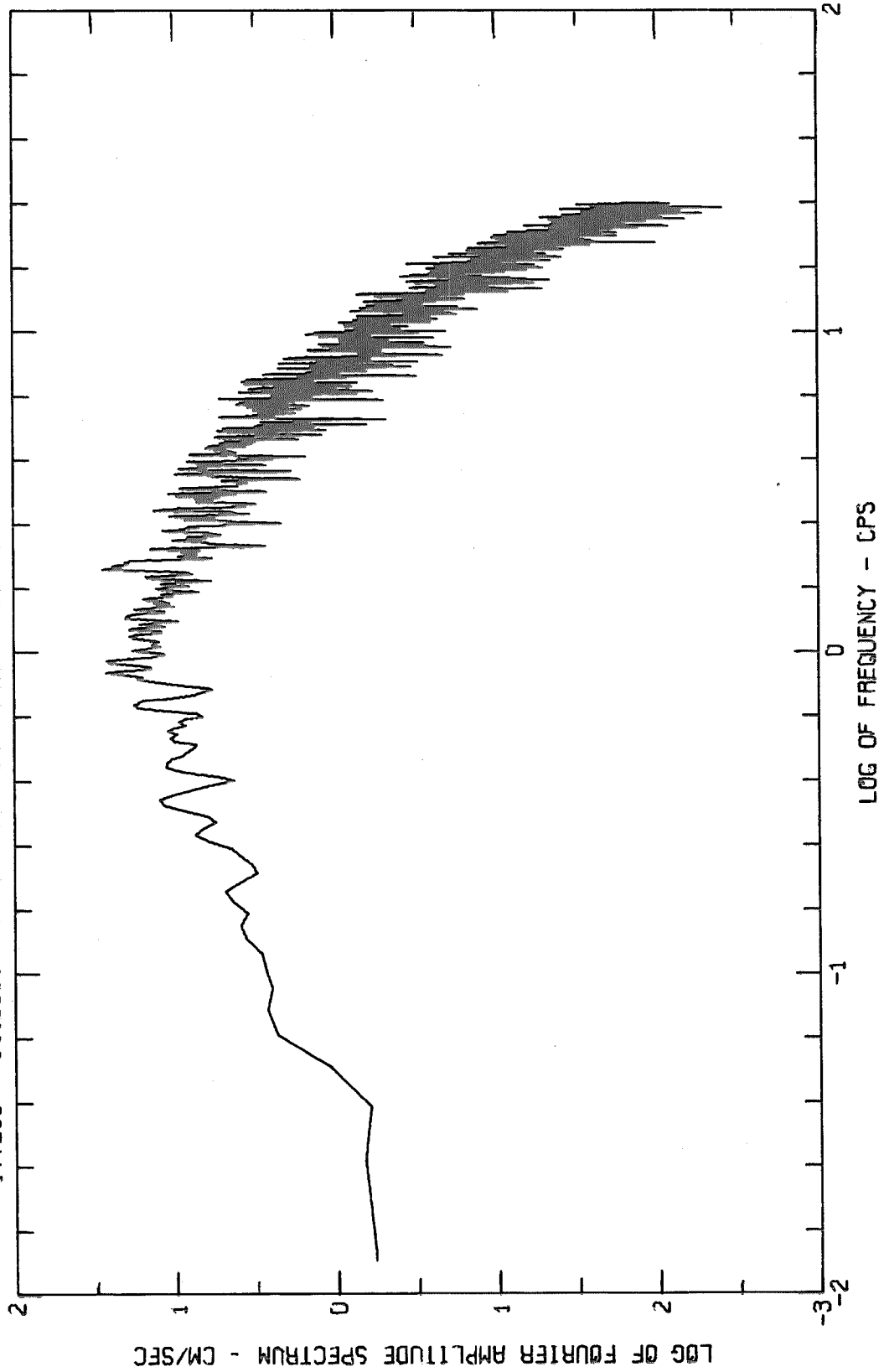
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
LOWER CALIFORNIA EARTHQUAKE NOV 12. 1954 - 0427 PST  
IVT289 54.005. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



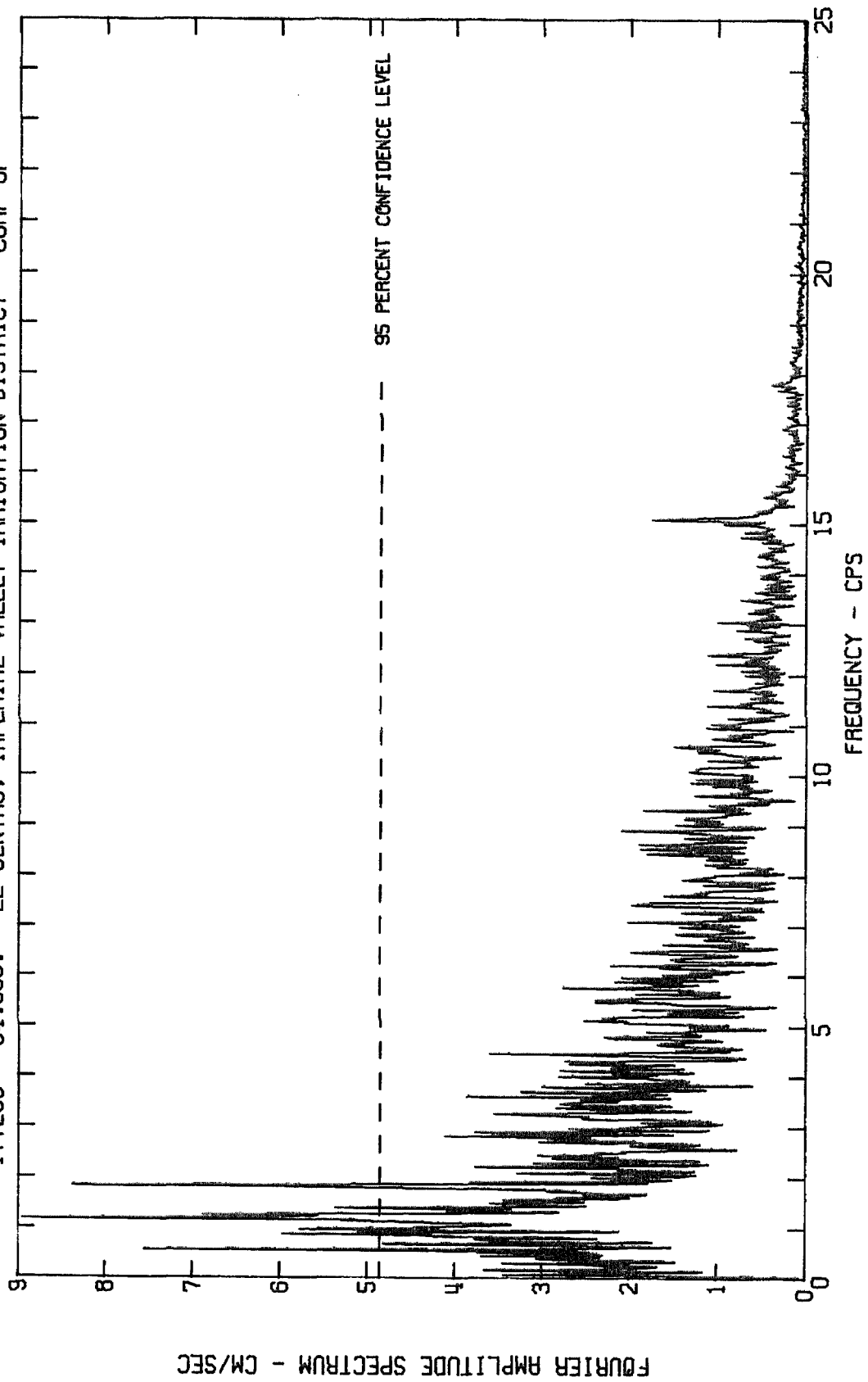




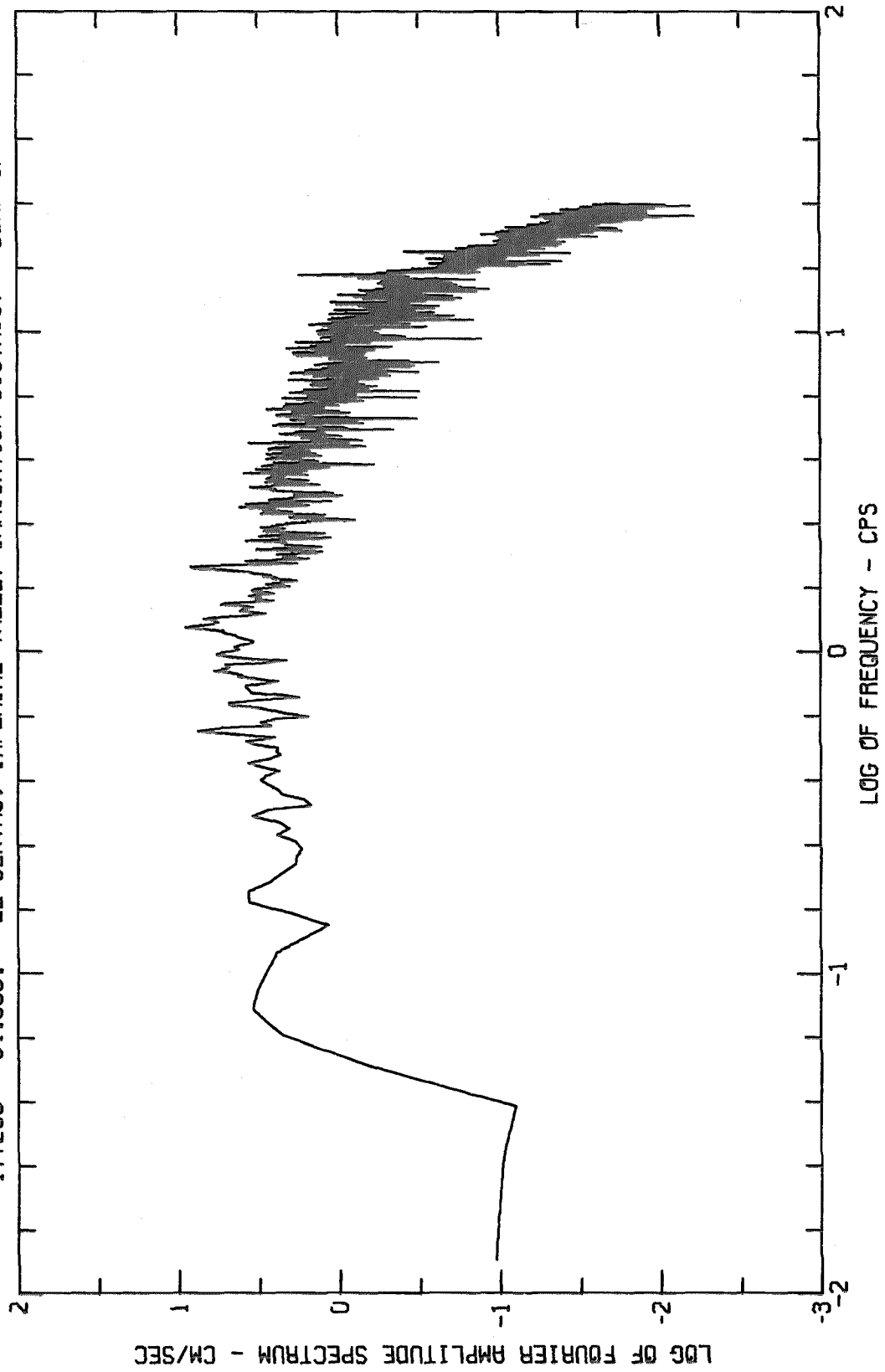
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
LOWER CALIFORNIA EARTHQUAKE NOV 12. 1954 04:27 PST  
1VT289 54.005. EL CENTRO. IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST

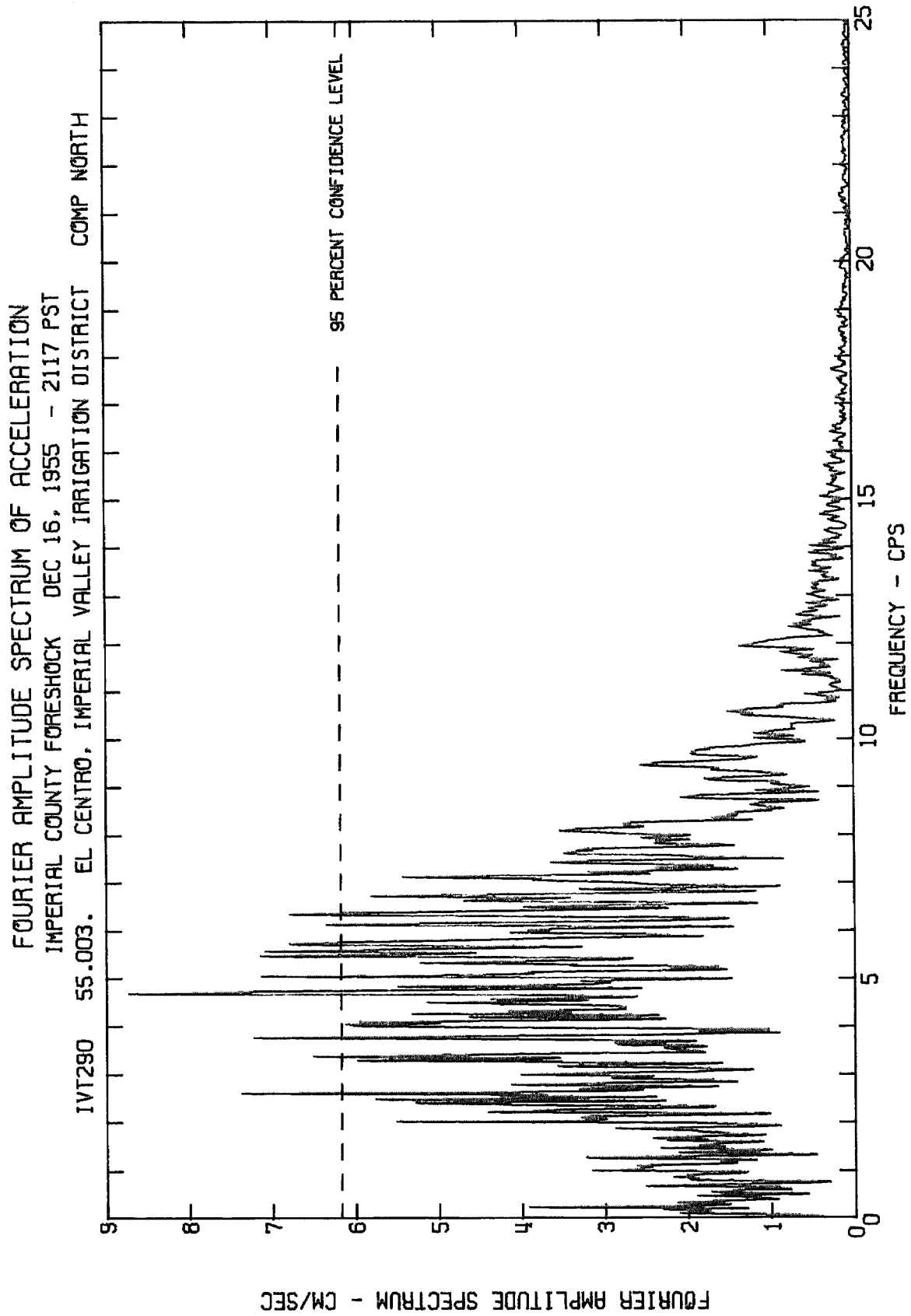


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
LOWER CALIFORNIA EARTHQUAKE NOV 12, 1954 - 0427 PST  
IVT289 54.005. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP

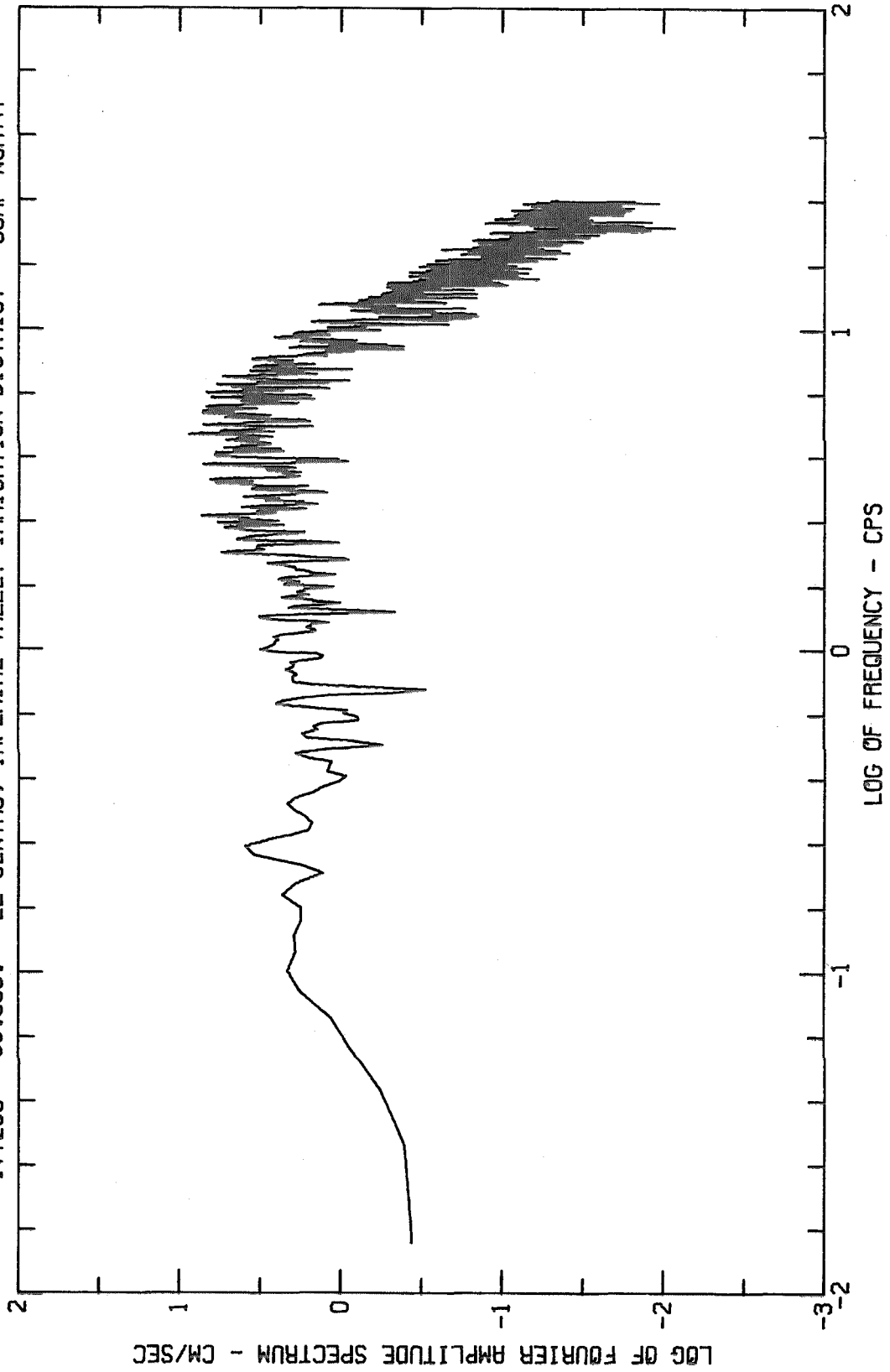


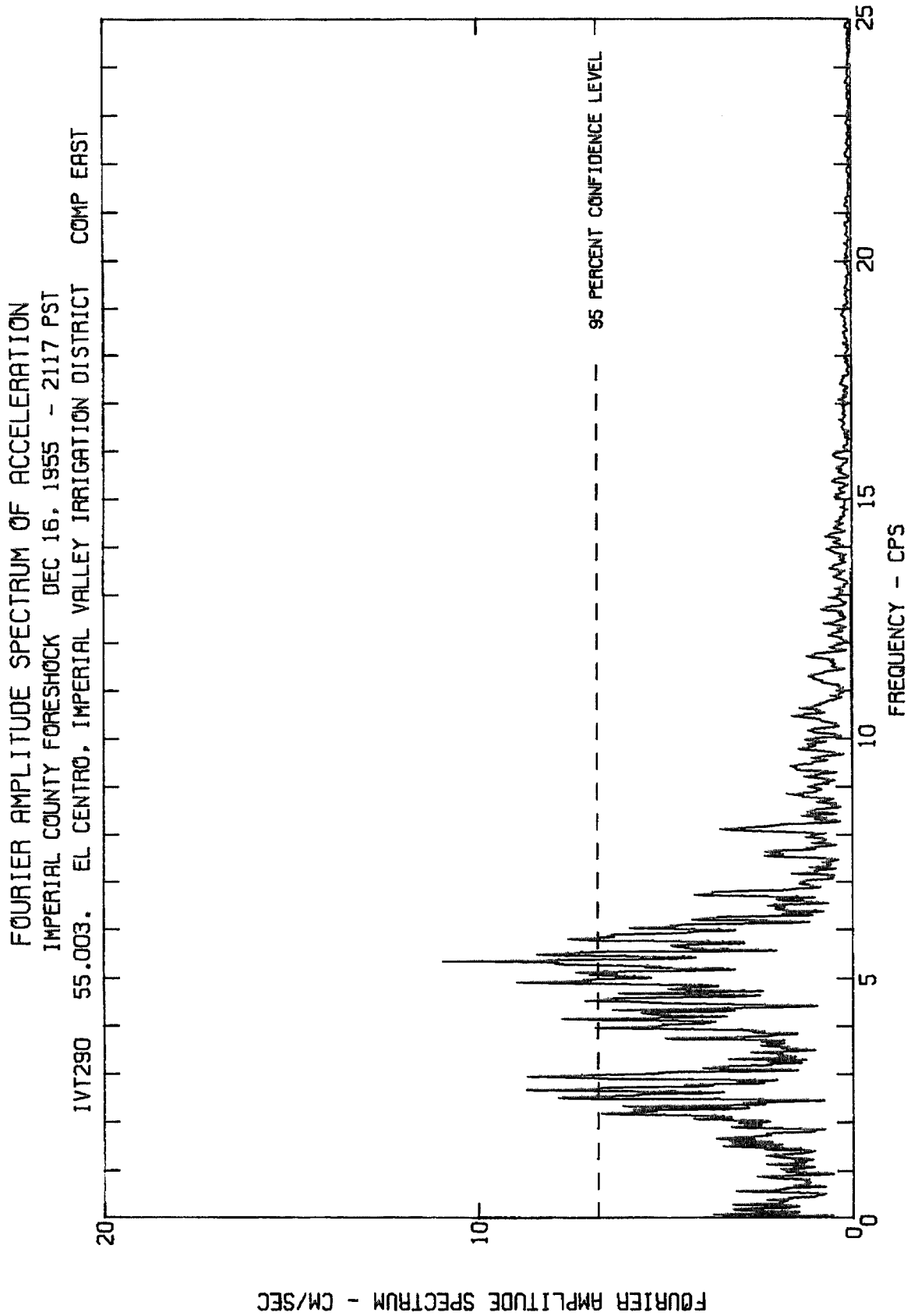
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LOWER CALIFORNIA EARTHQUAKE NOV 12, 1954 - 0427 PST  
IVT289 54.005. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP



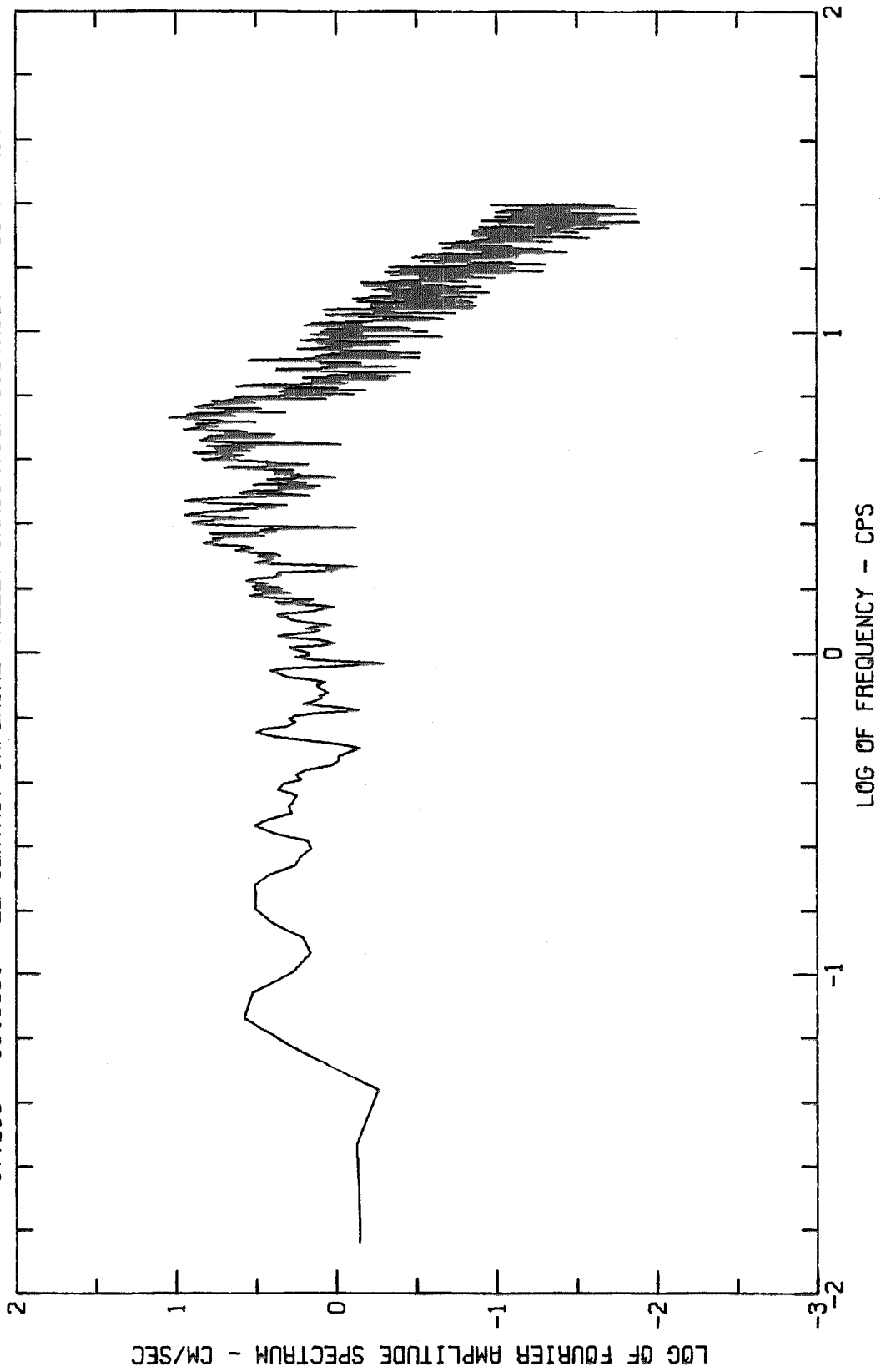


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL COUNTY FORESHOCK DEC 16, 1955 - 2117 PST  
1VT290 55.003. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH

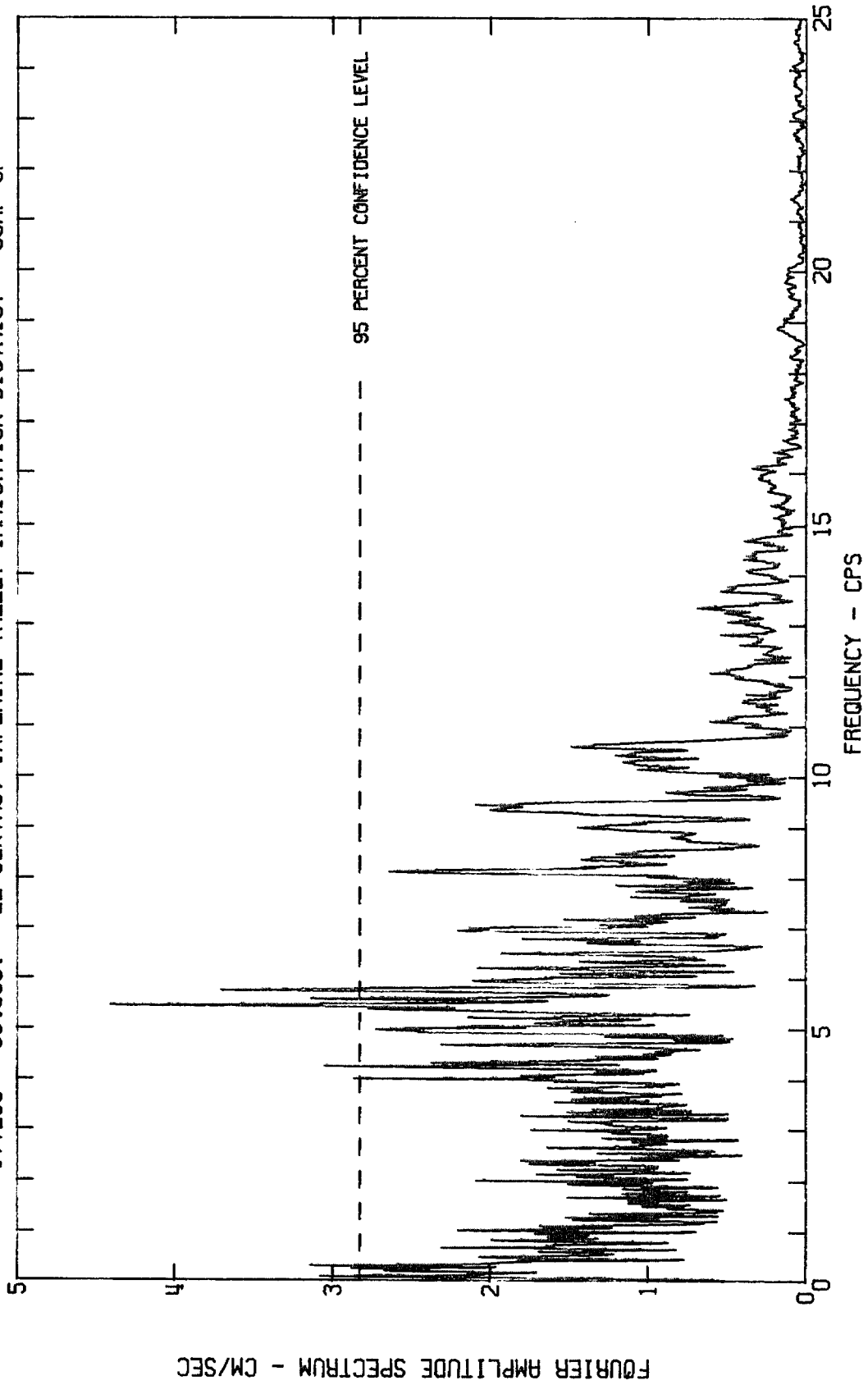




FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL COUNTY FORESHOCK DEC 16, 1955 - 2117 PST  
1VT290 55.003. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST

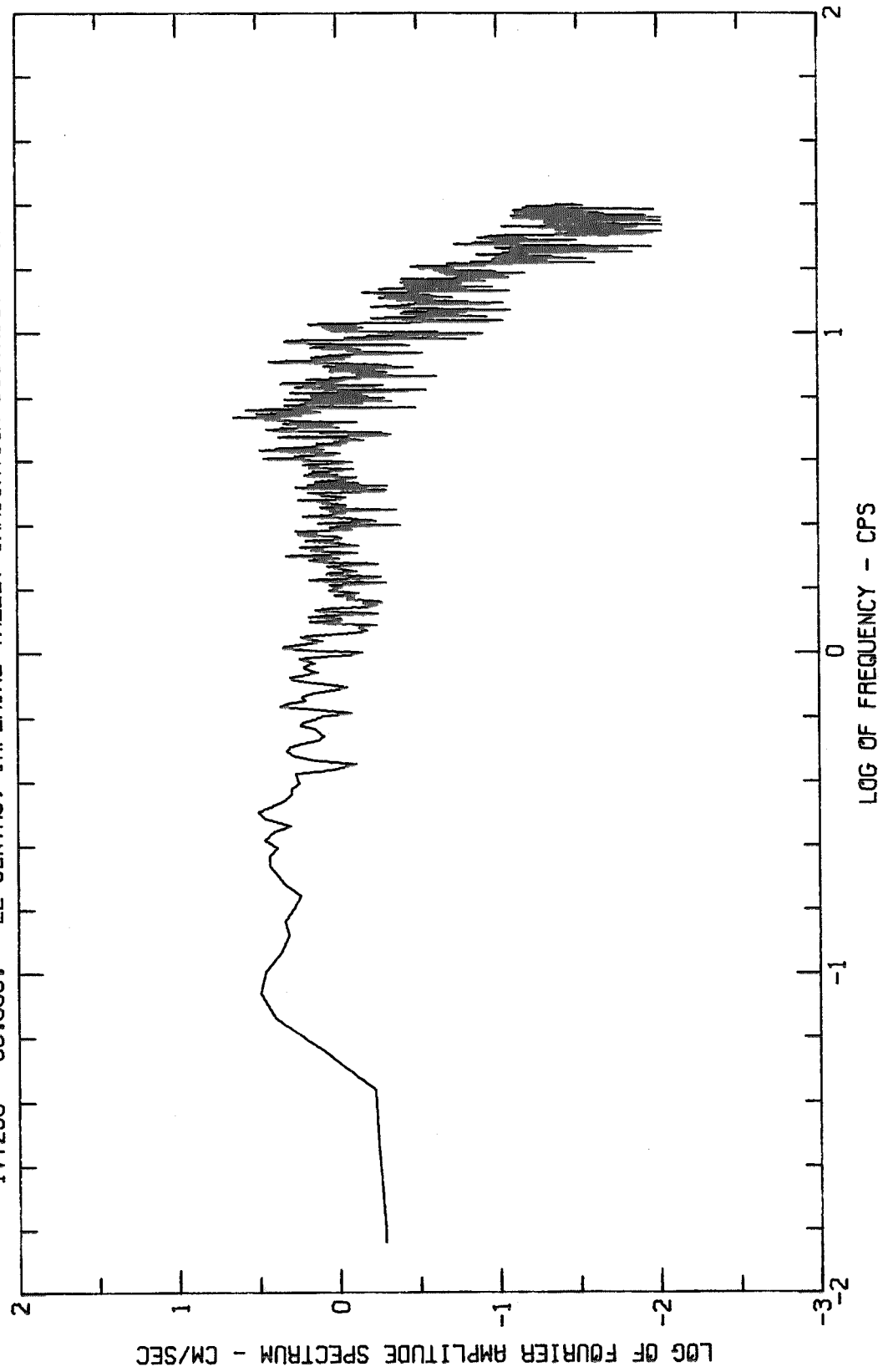


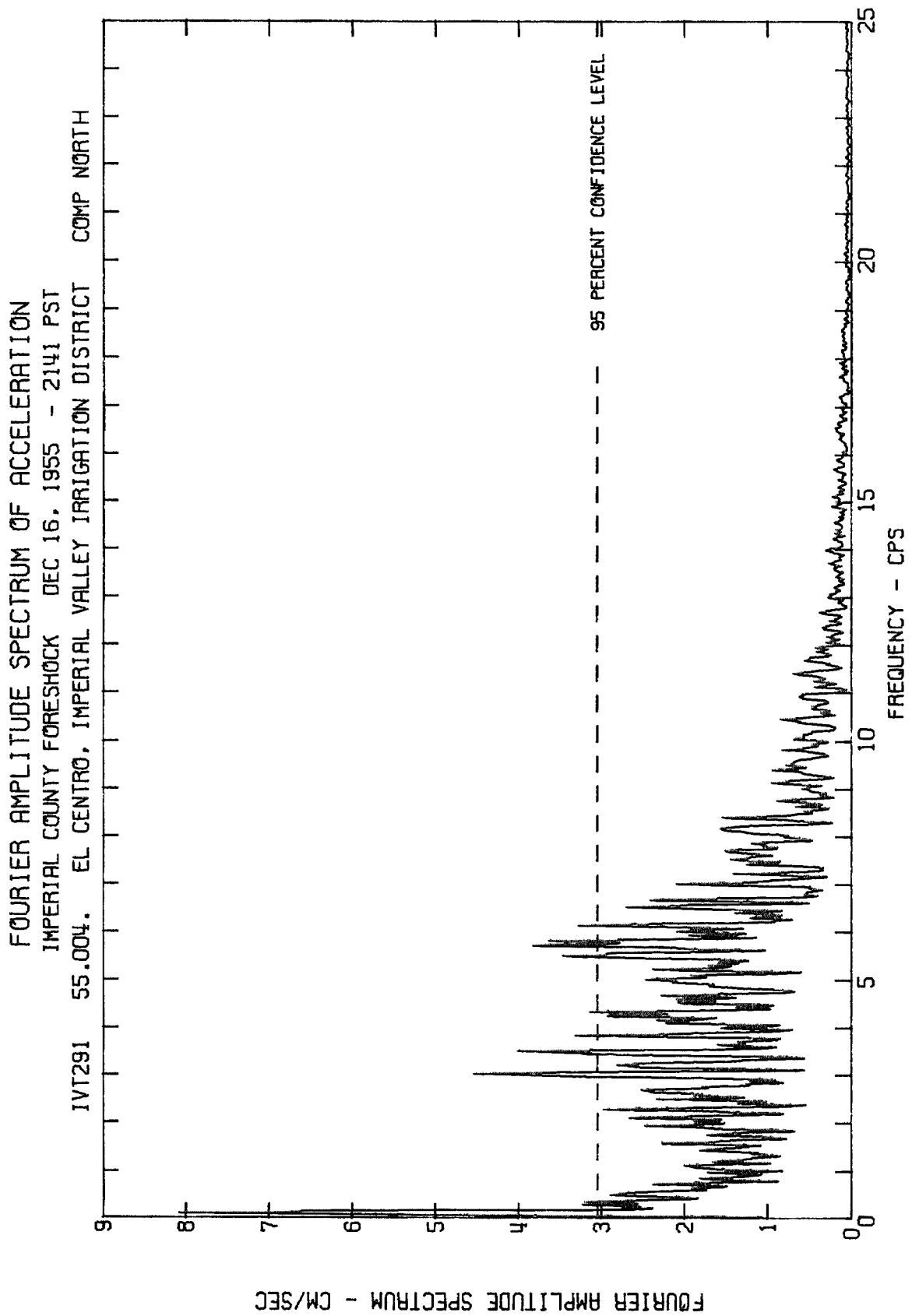
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IMPERIAL COUNTY FORESHOCK DEC 16, 1955 - 2117 PST  
IVT290 55.003. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP



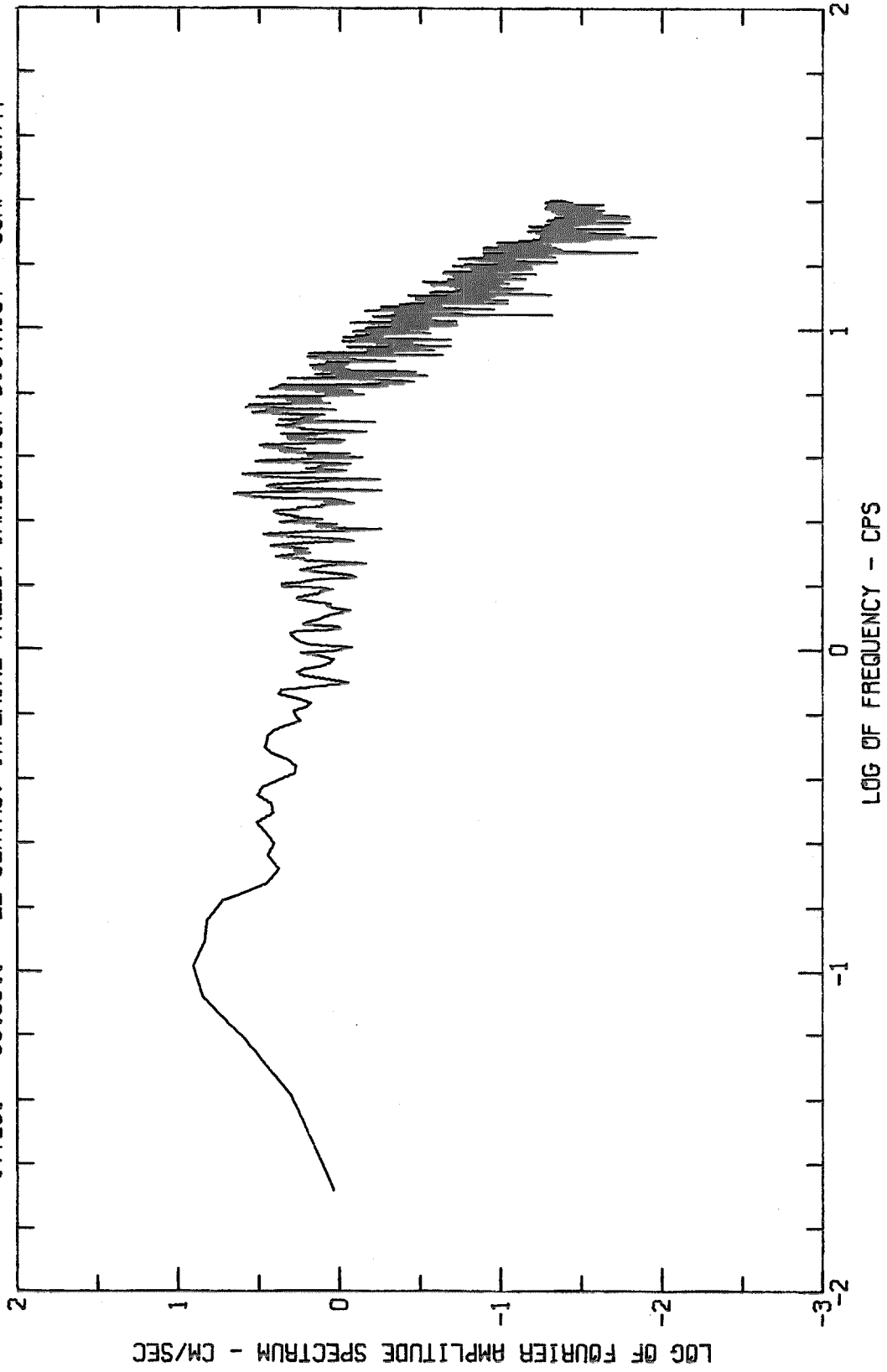


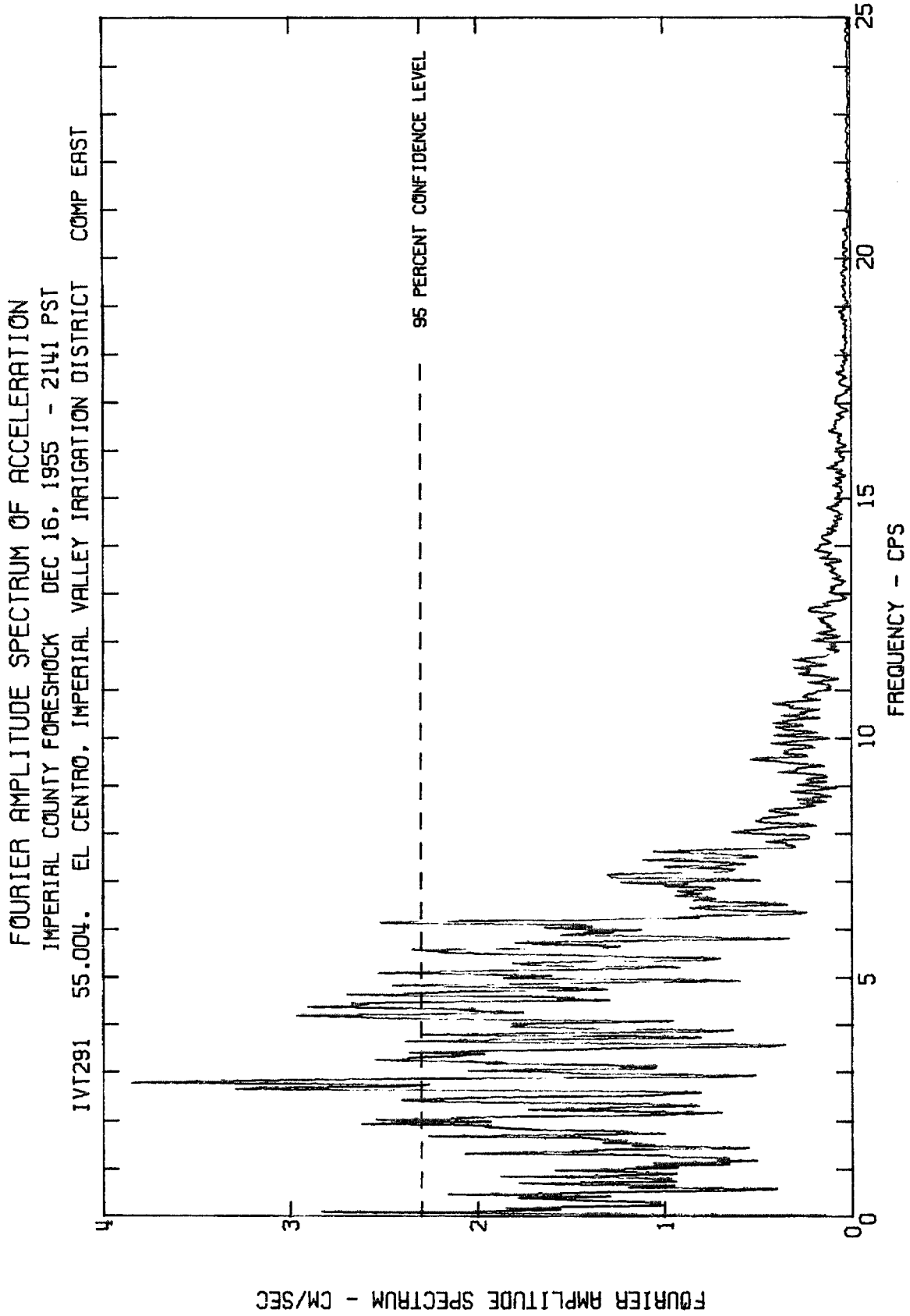
IVT290 55.003. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP  
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IMPERIAL COUNTY FORESHOCK DEC 16, 1955 - 2117 PST



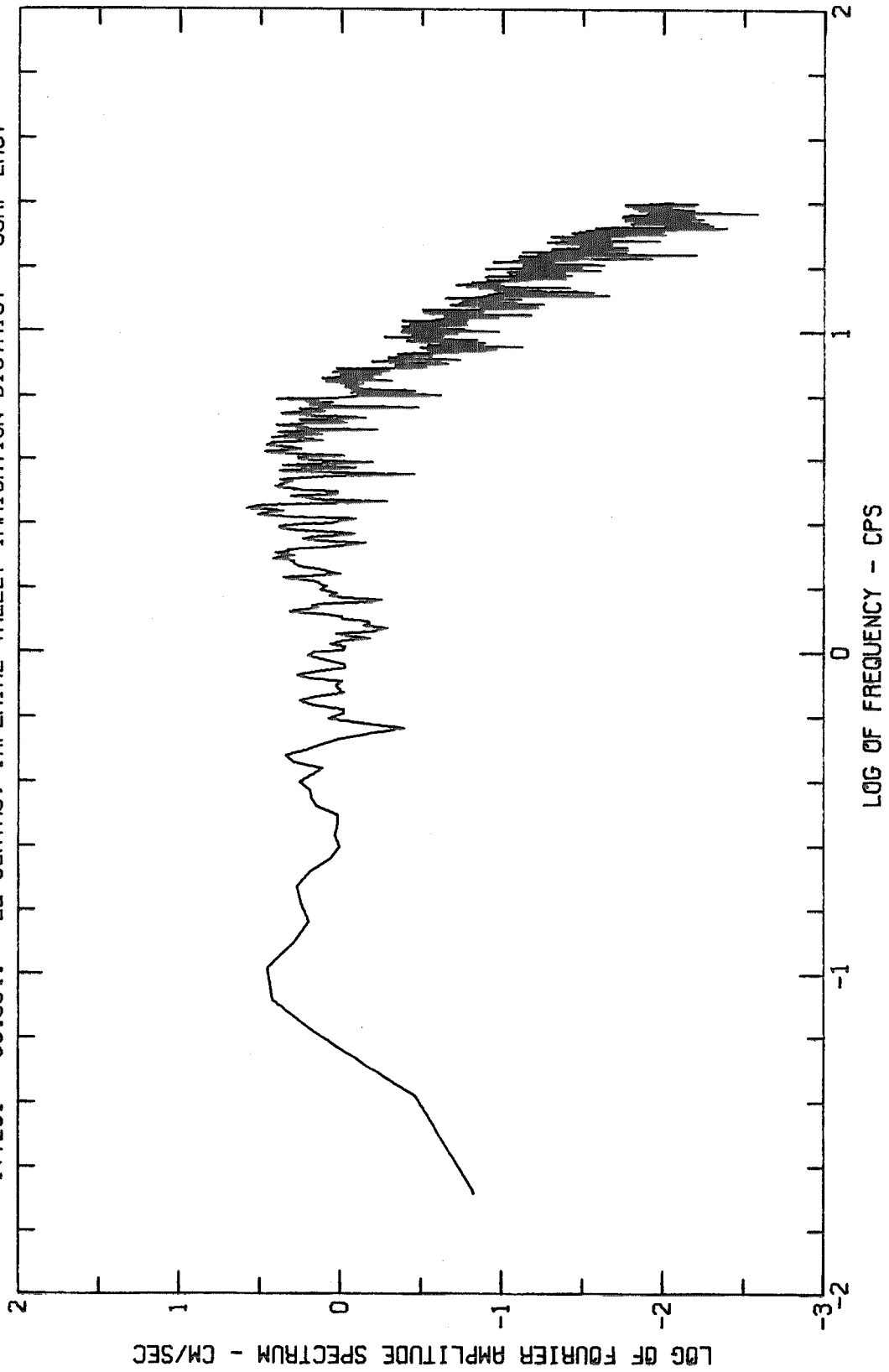


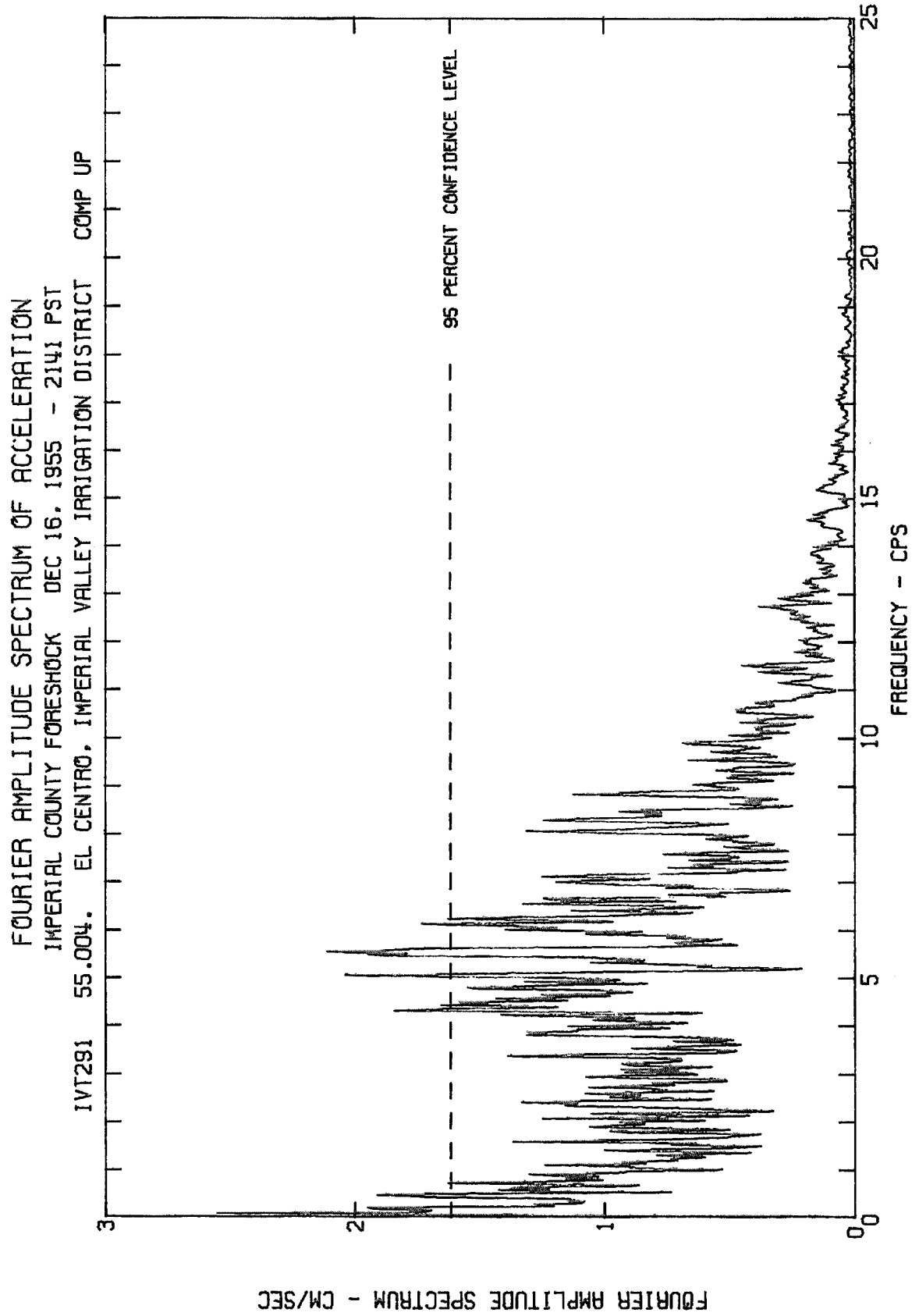
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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1VT291 55.004. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



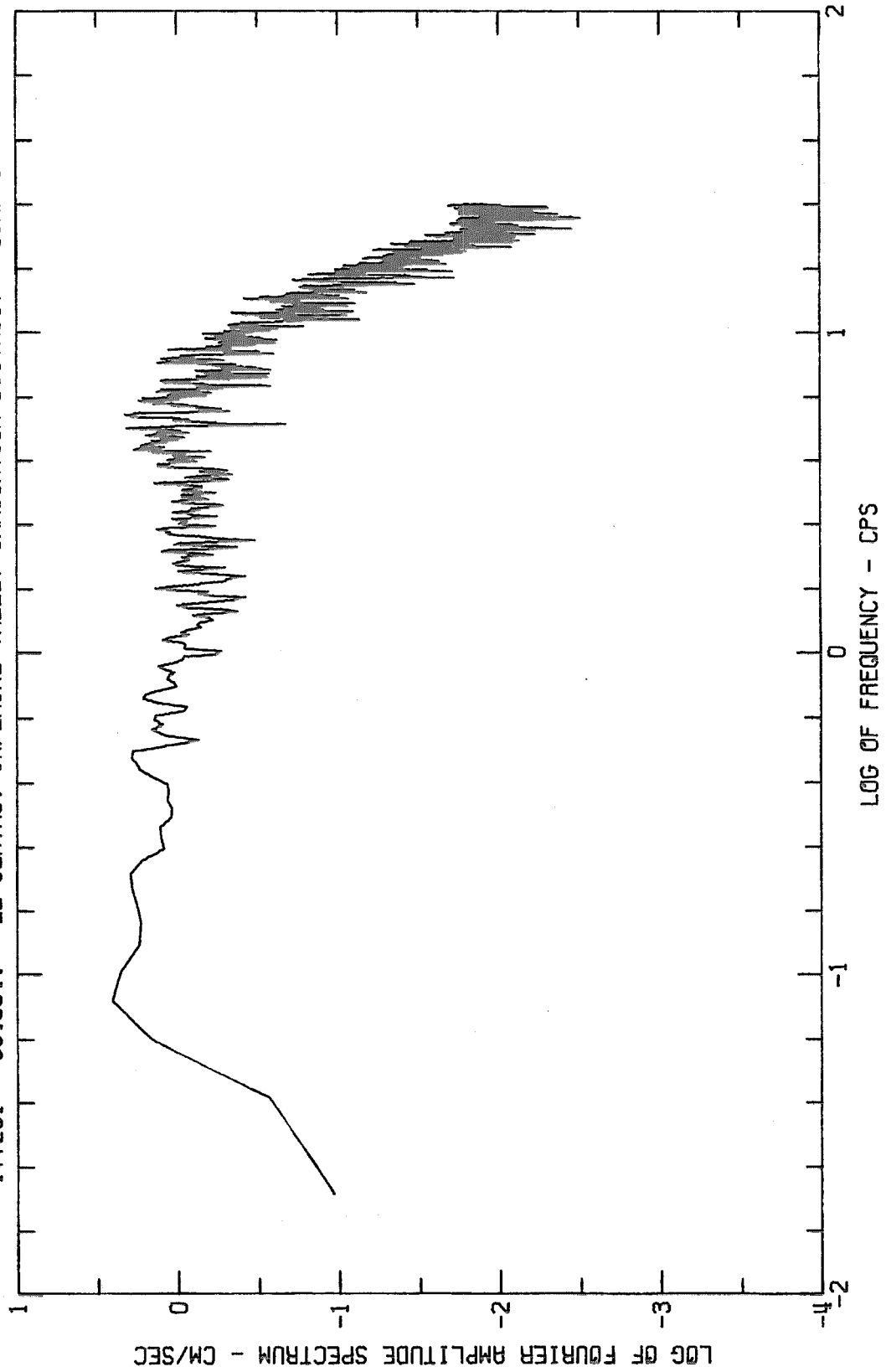


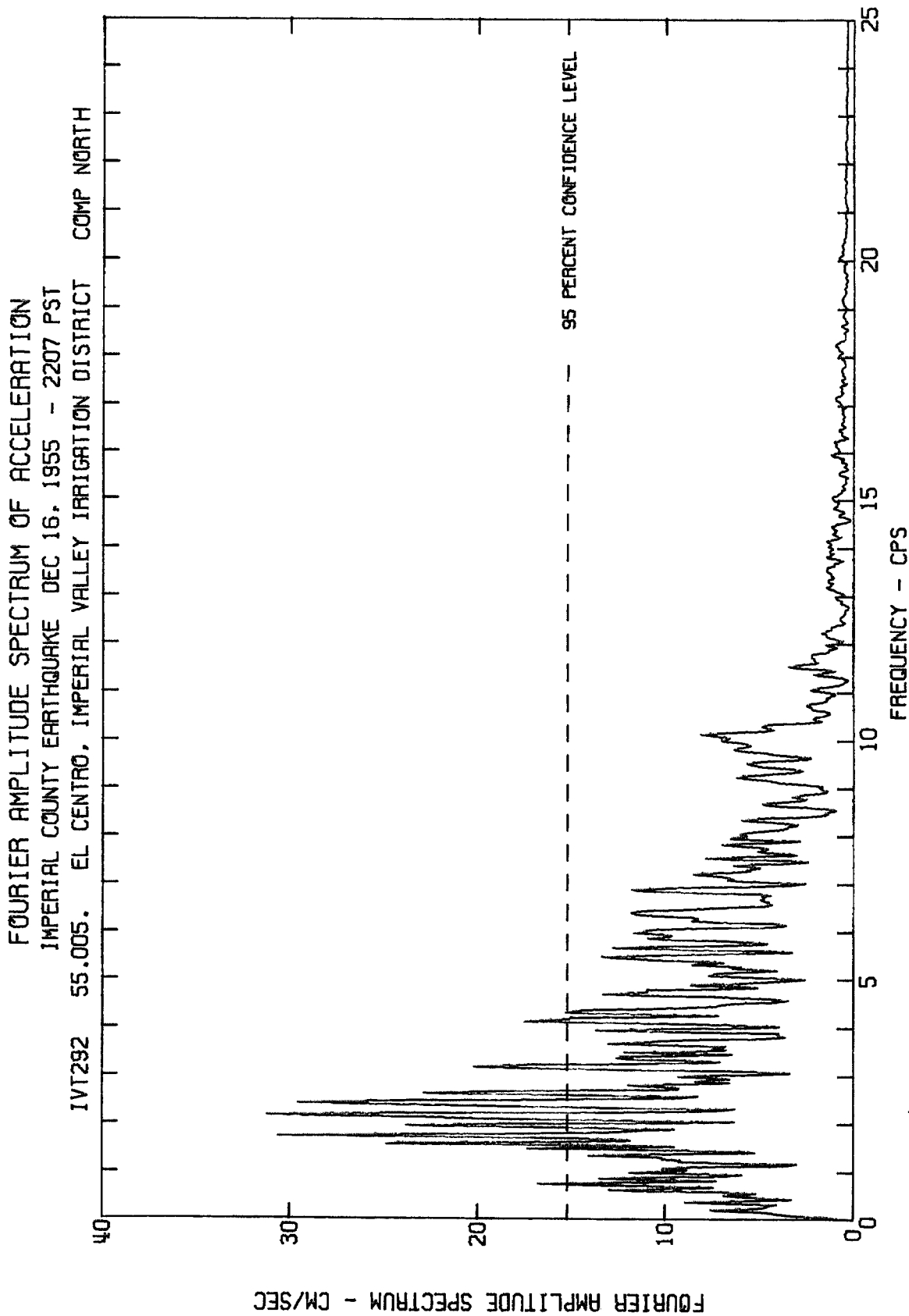
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FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL COUNTY FORESHOCK DEC 16, 1955 - 2141 PST





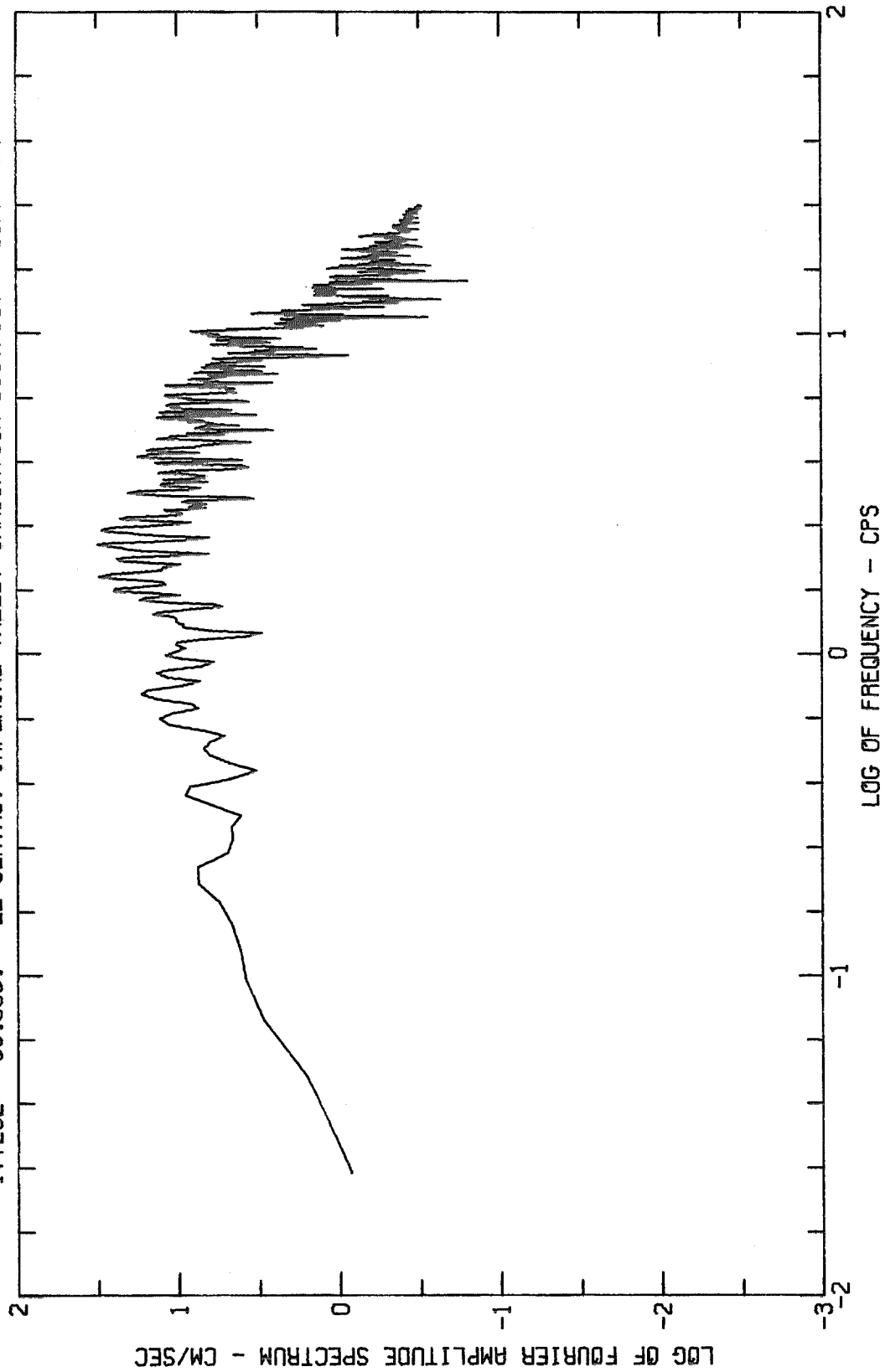
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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1VT291 55.004. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP

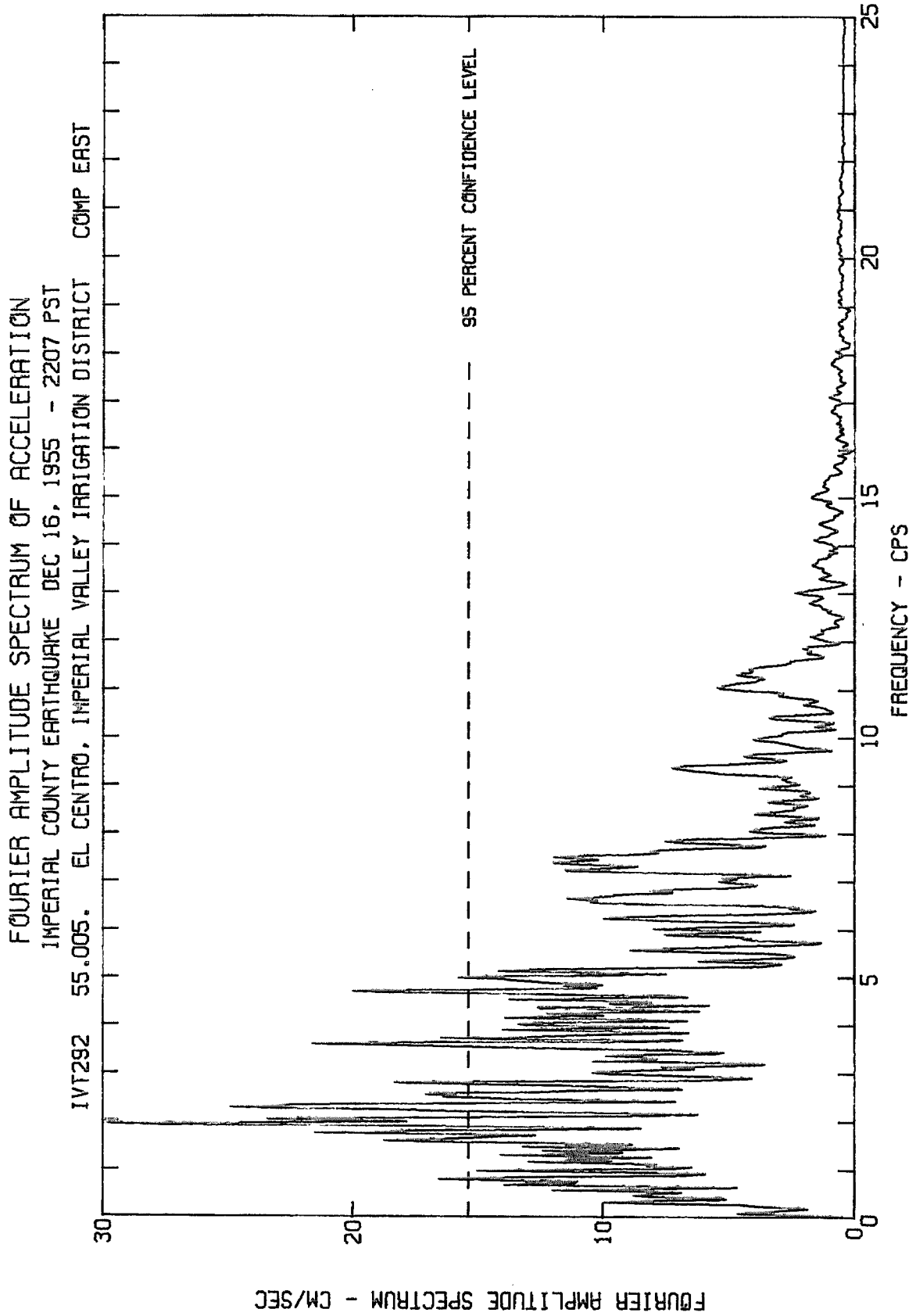




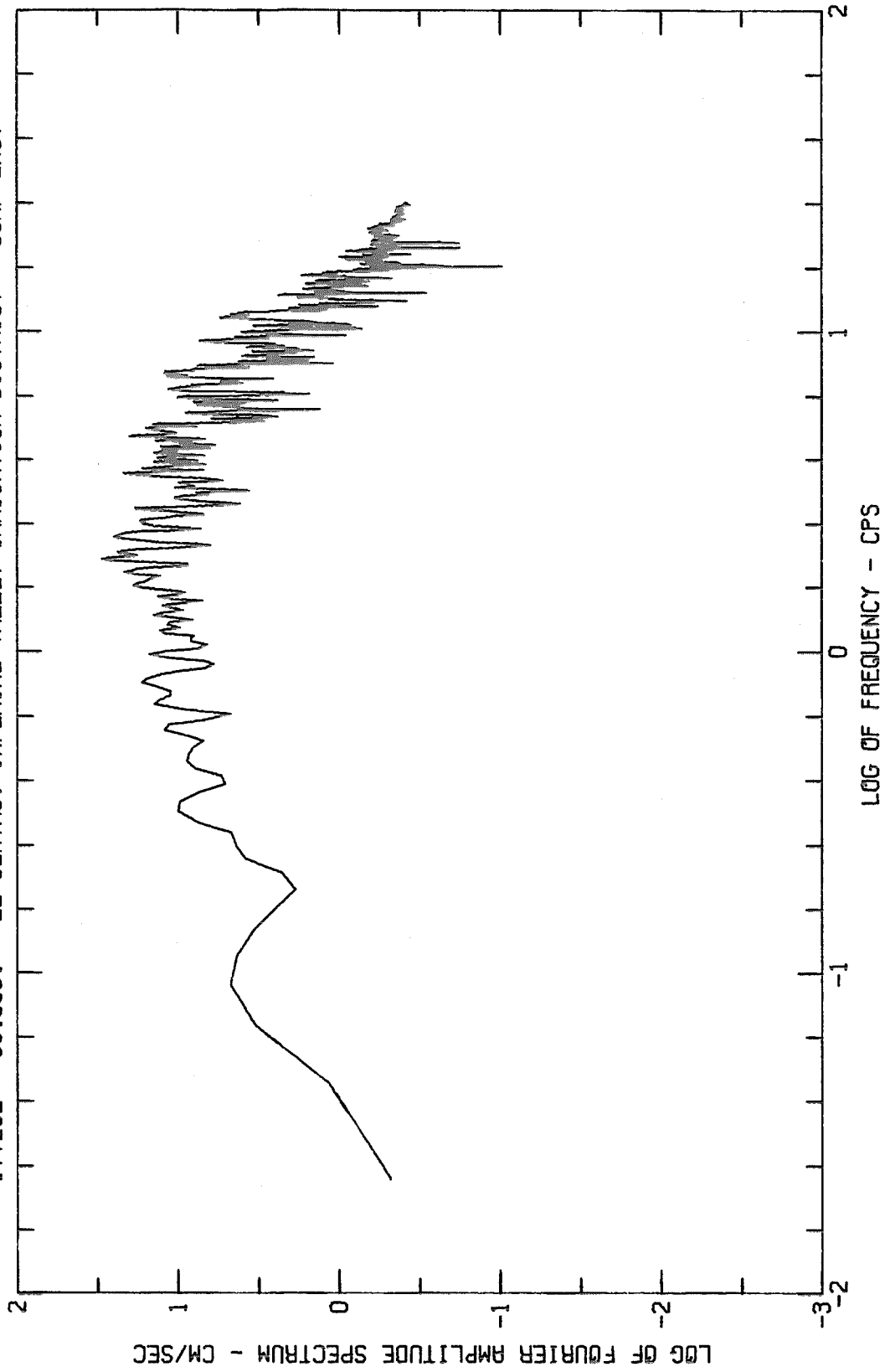


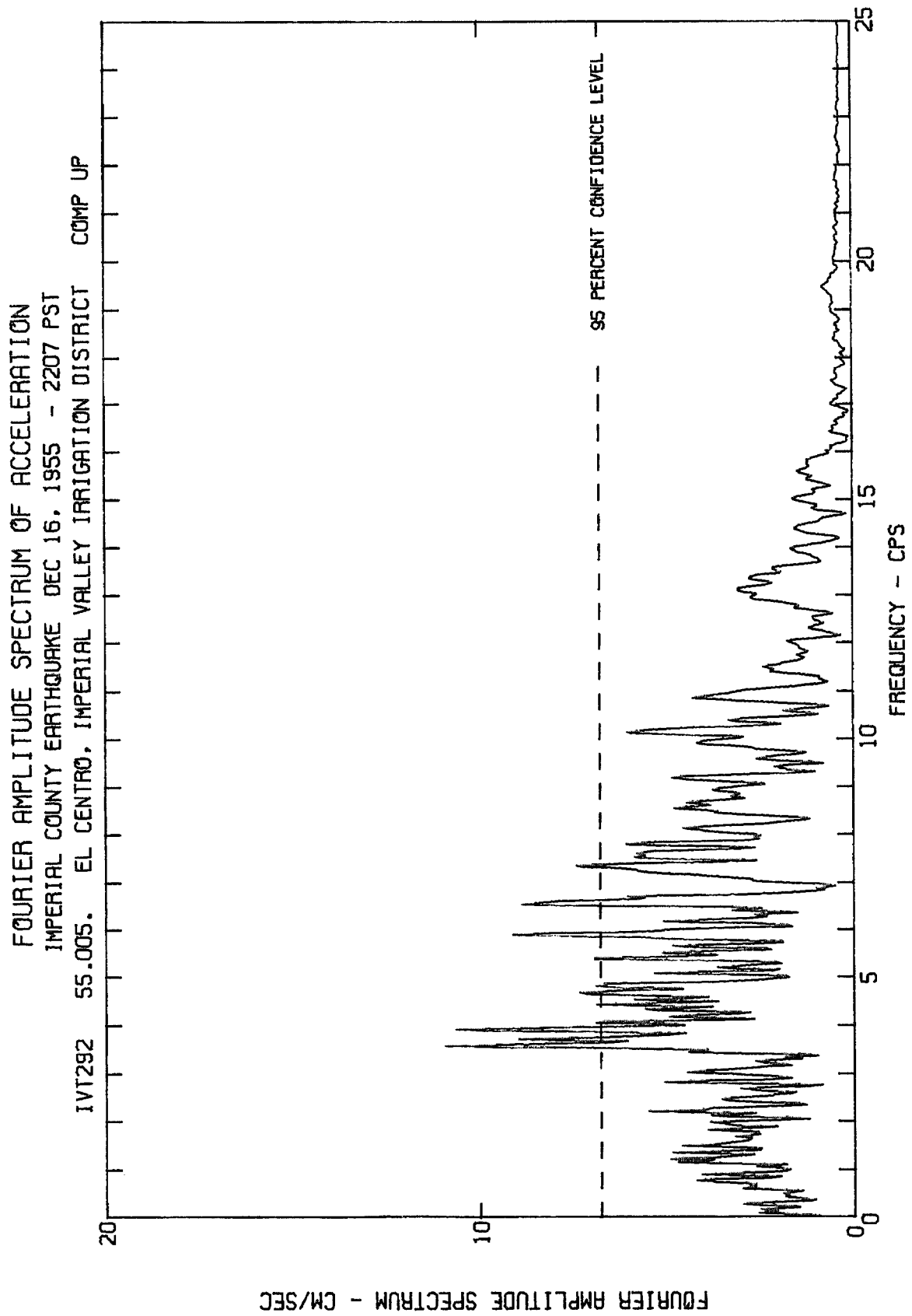
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL COUNTY EARTHQUAKE DEC 16, 1955 - 2207 PST  
1VT292 55.005. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH



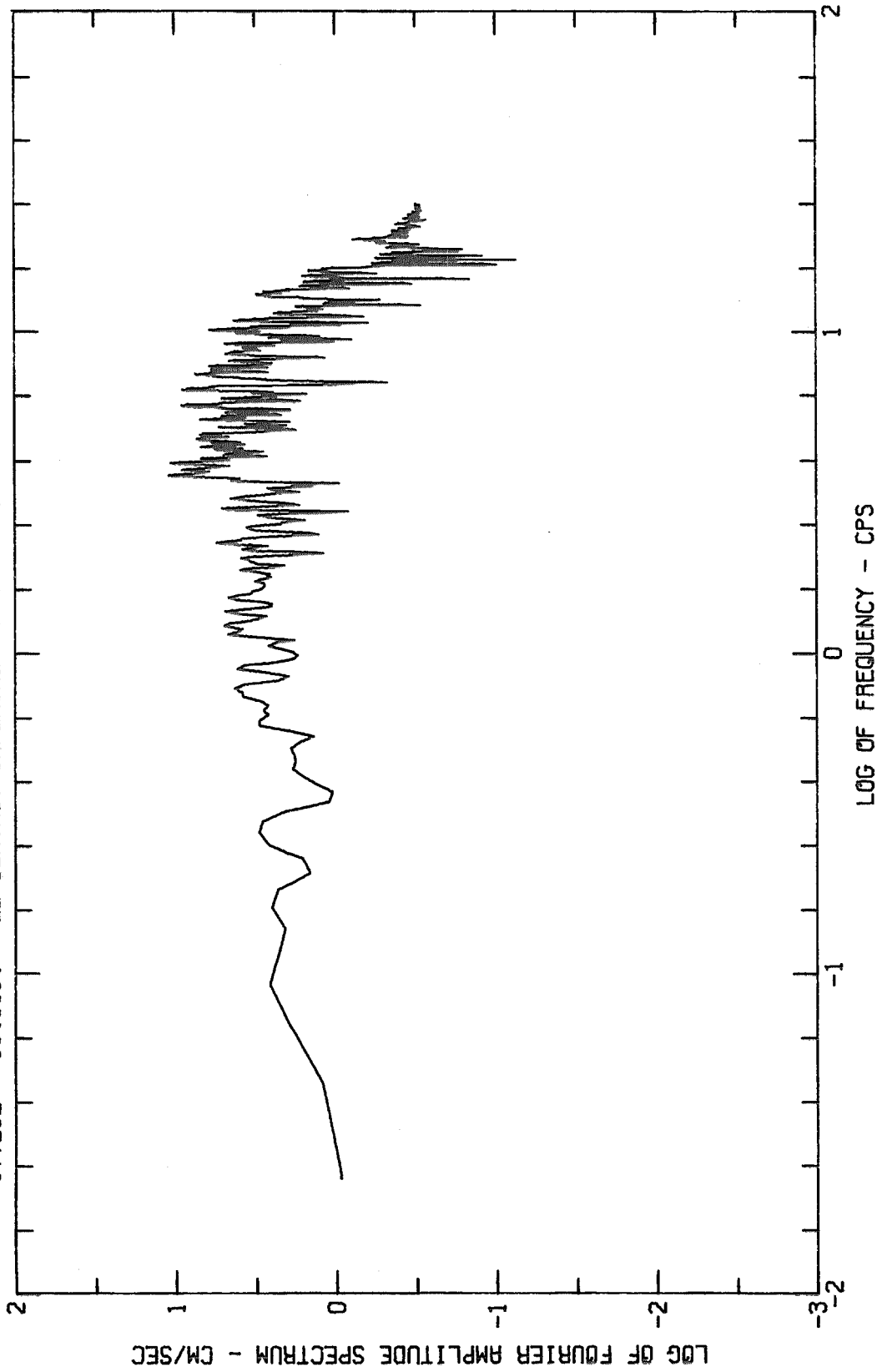


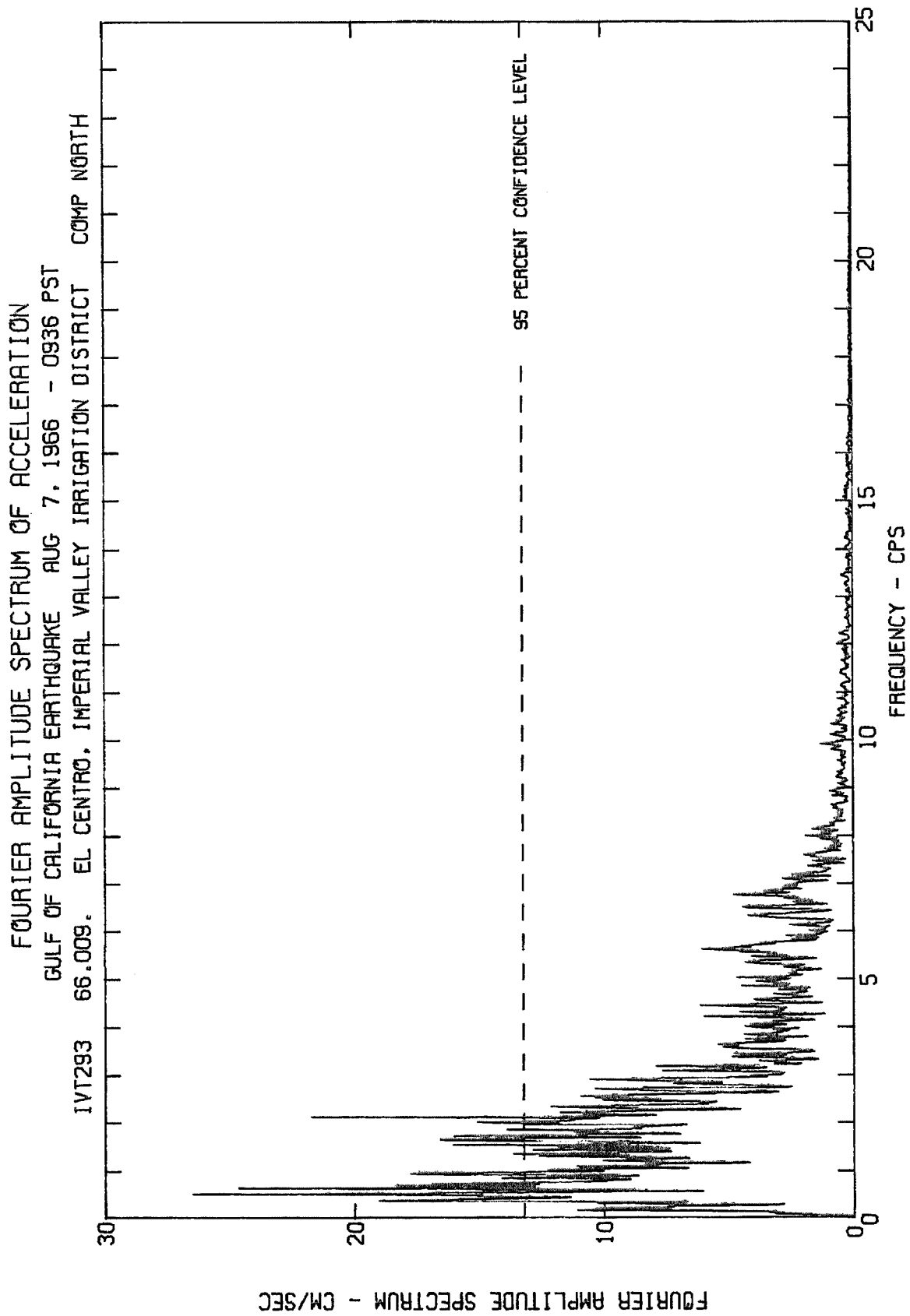
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL COUNTY EARTHQUAKE DEC 16, 1955 - 2207 PST  
1VT292 55.005. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST



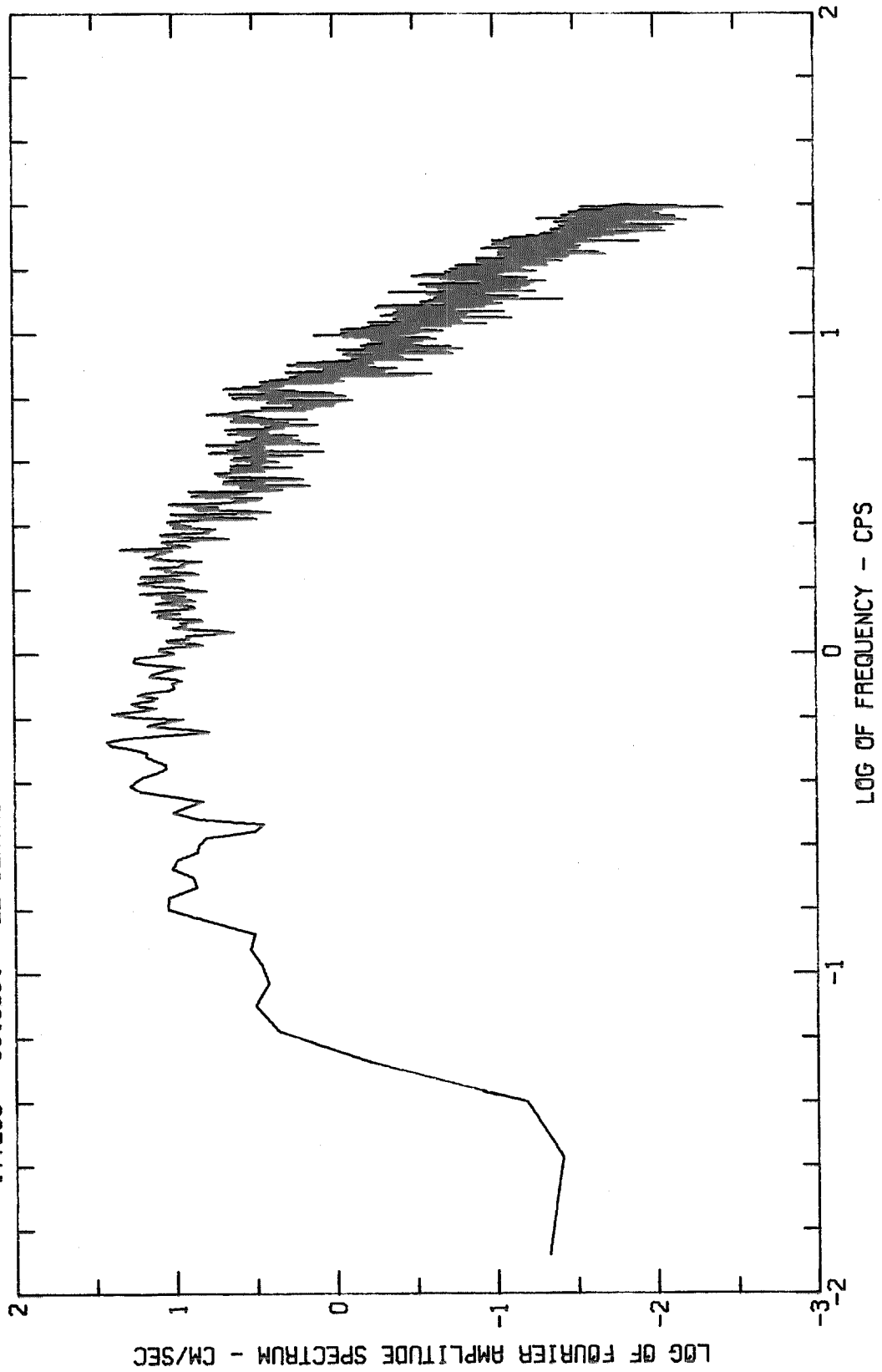


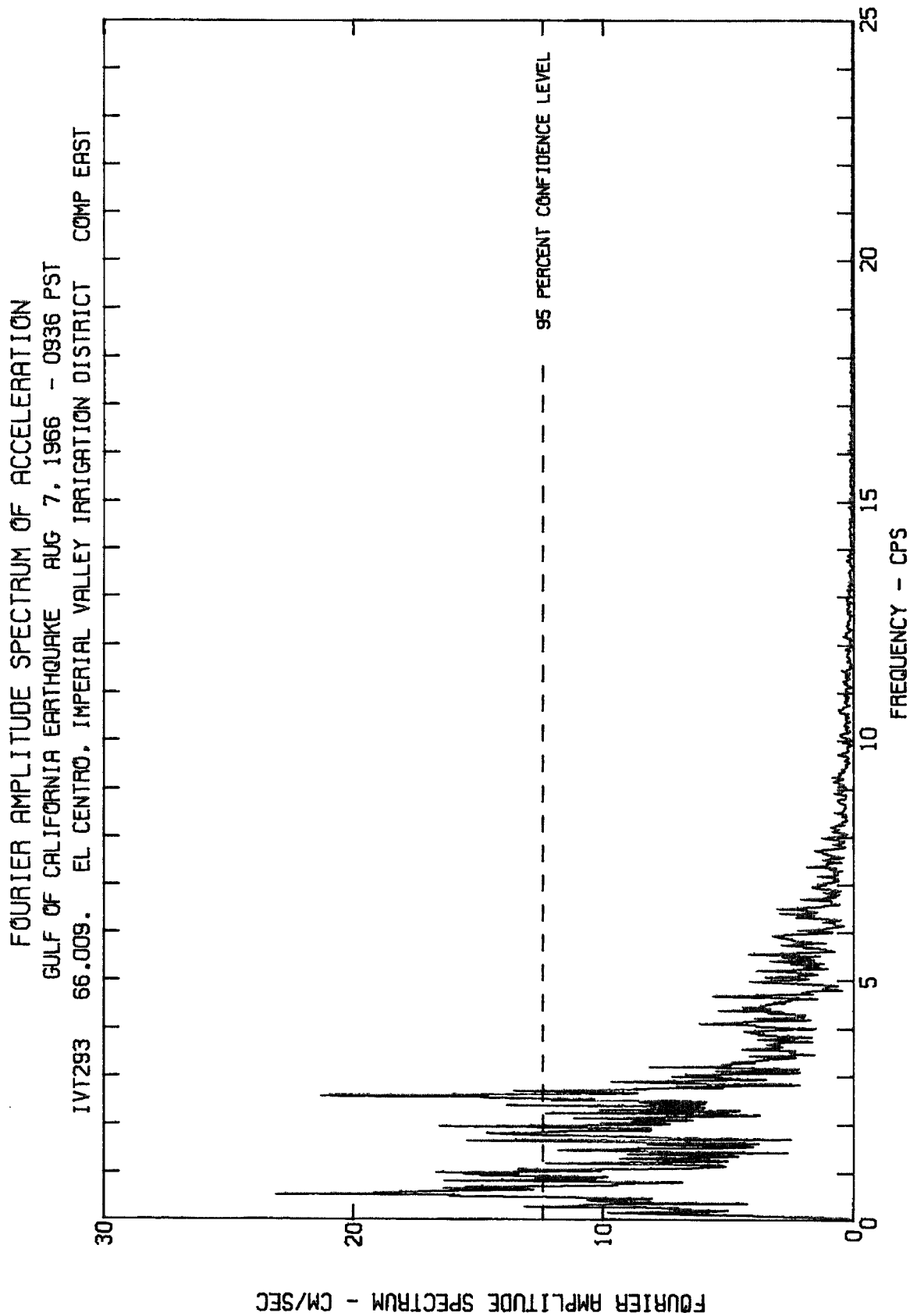
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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1VT292 55.005. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP UP





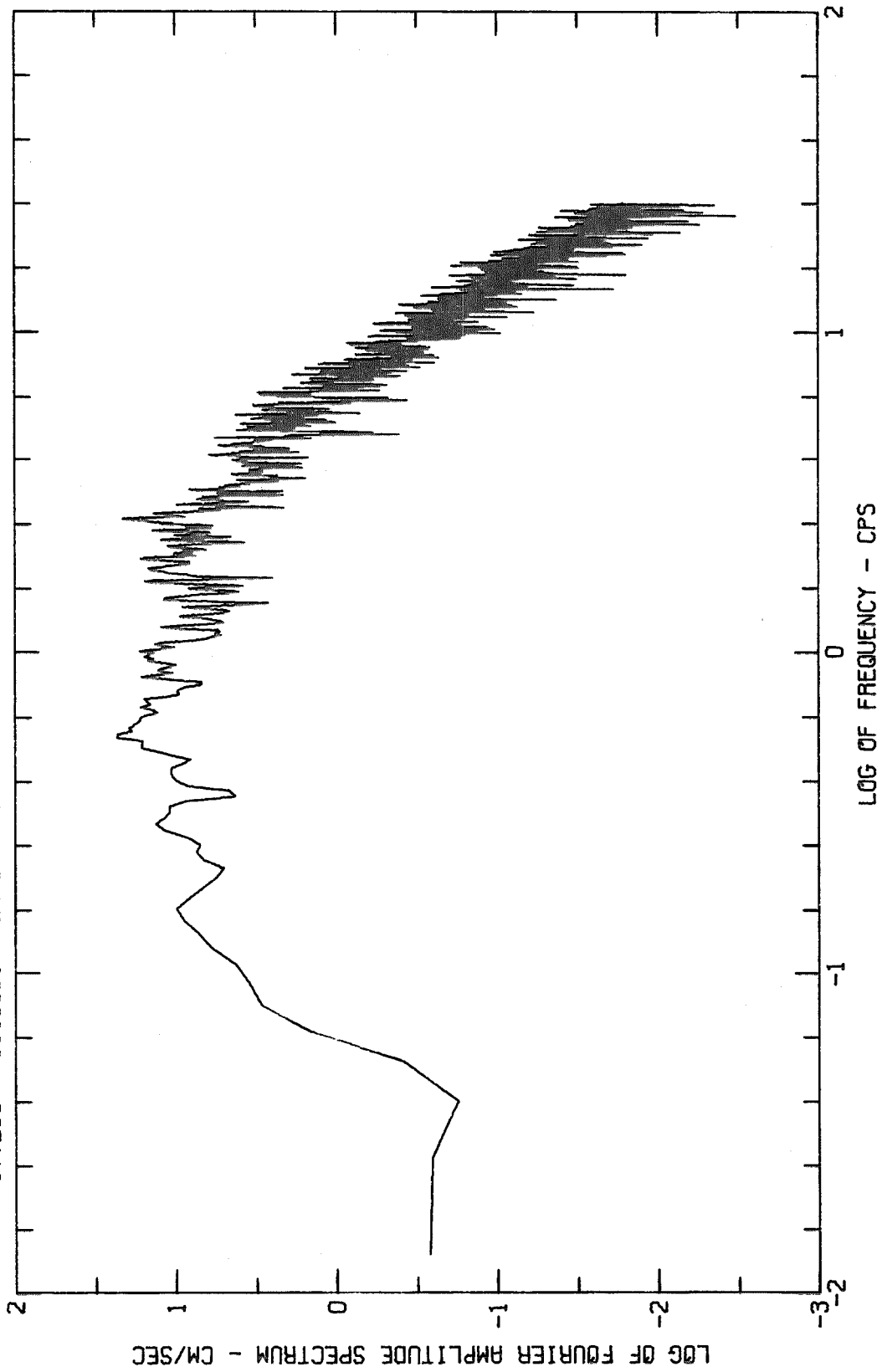
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
GULF OF CALIFORNIA EARTHQUAKE AUG 7, 1966 - 0936 PST  
1VT293 66.009. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP NORTH

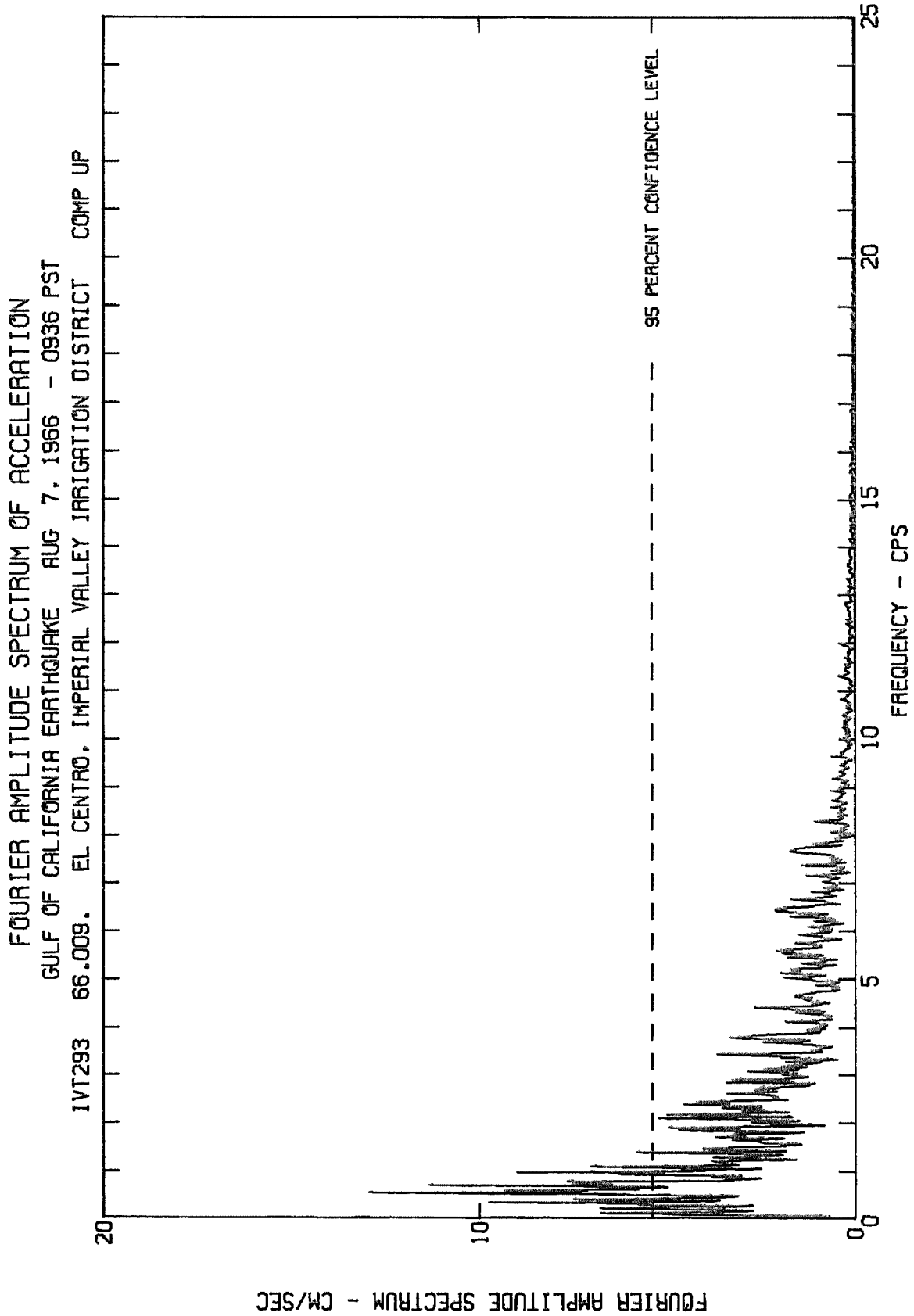


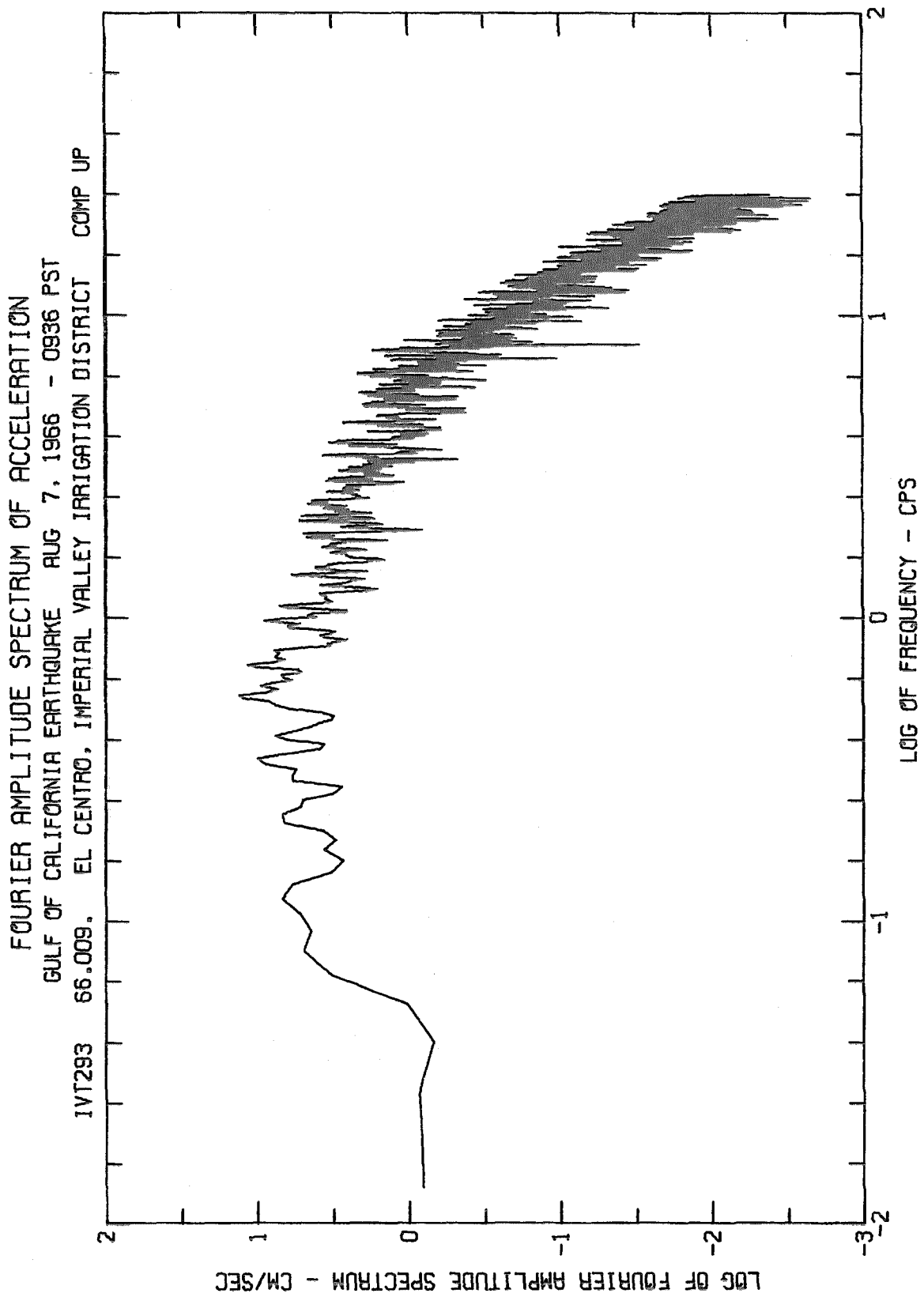




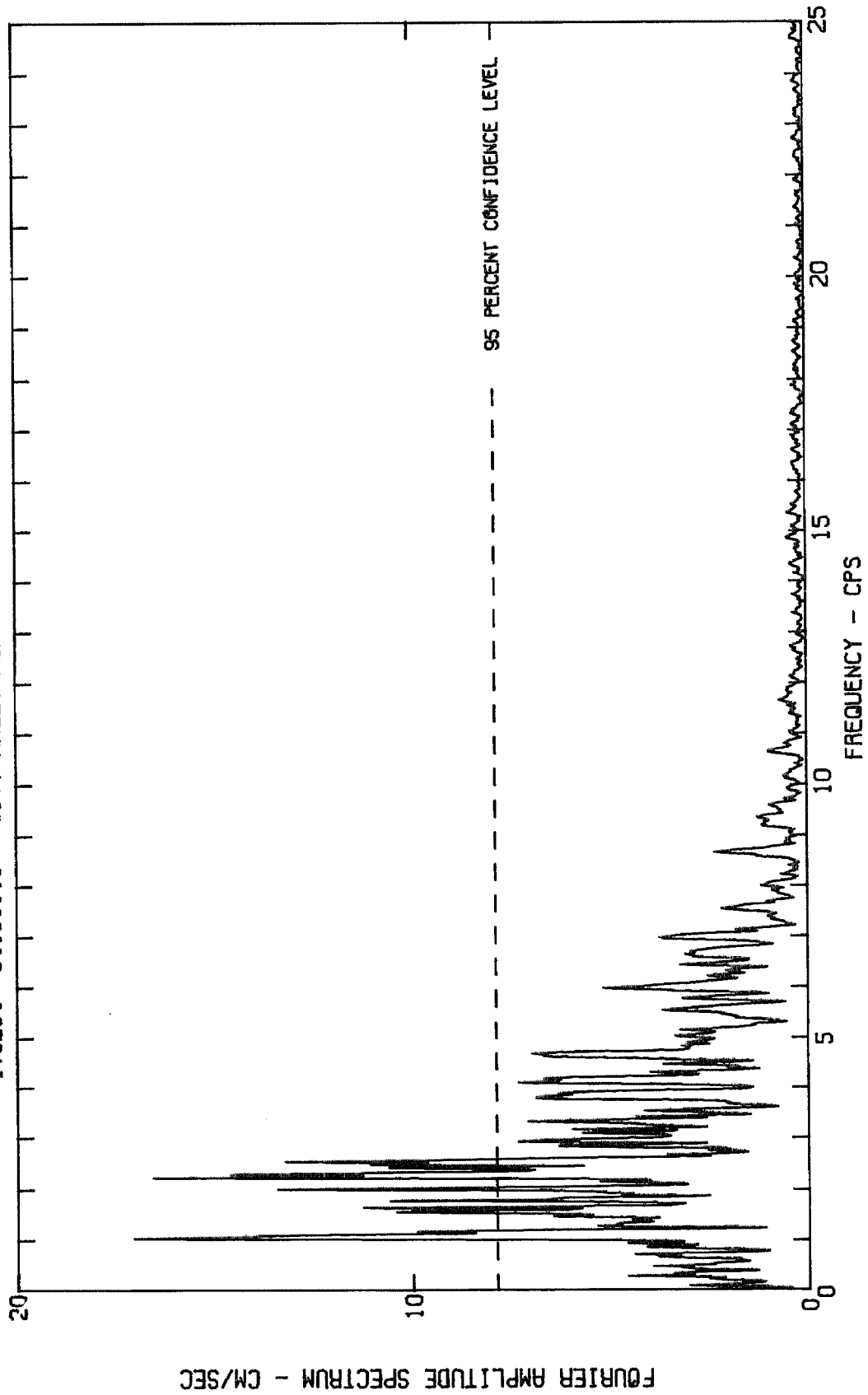
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
GULF OF CALIFORNIA EARTHQUAKE AUG 7, 1966 - 0936 PST  
1VT293 66.009. EL CENTRO, IMPERIAL VALLEY IRRIGATION DISTRICT COMP EAST



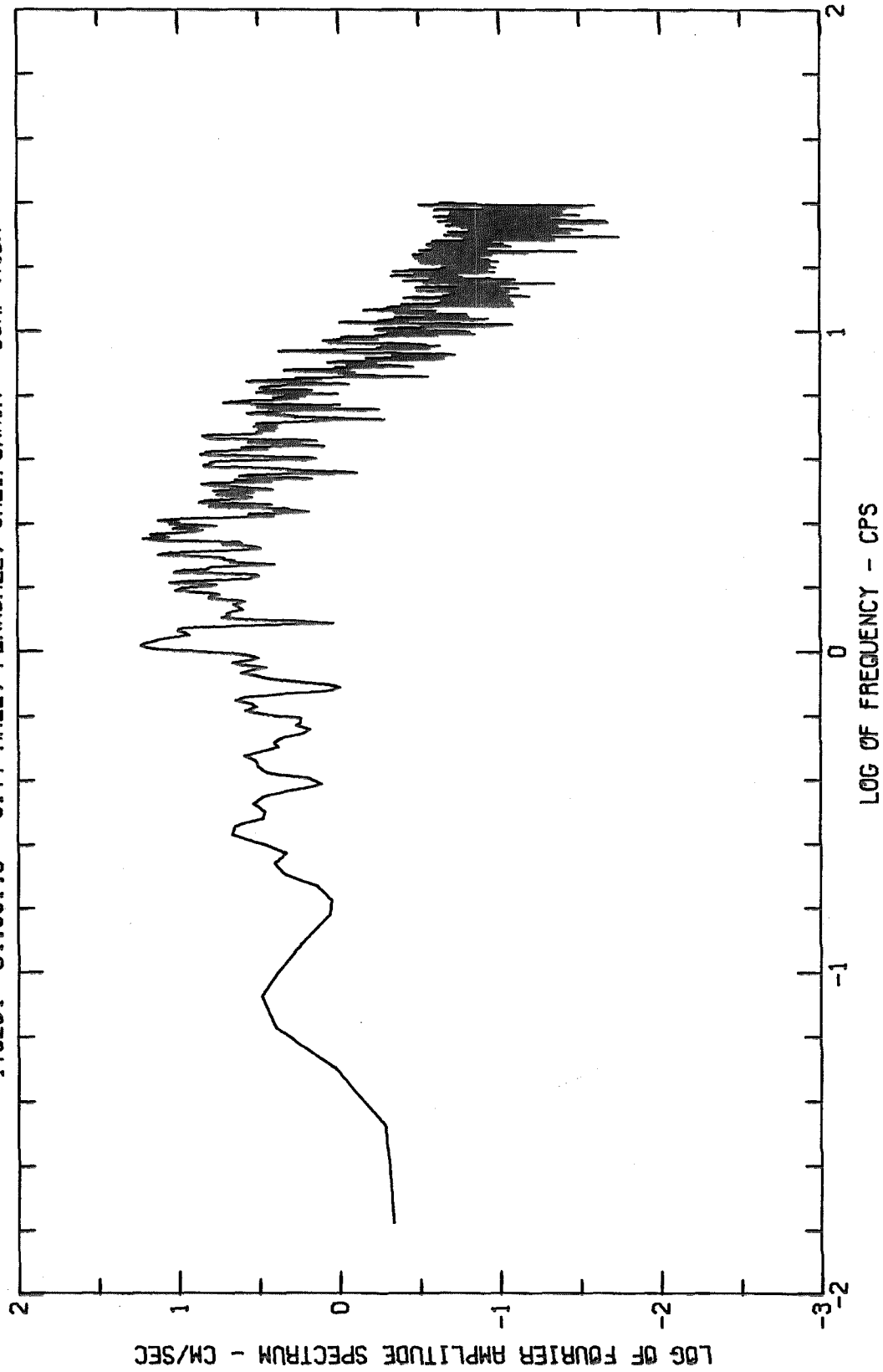




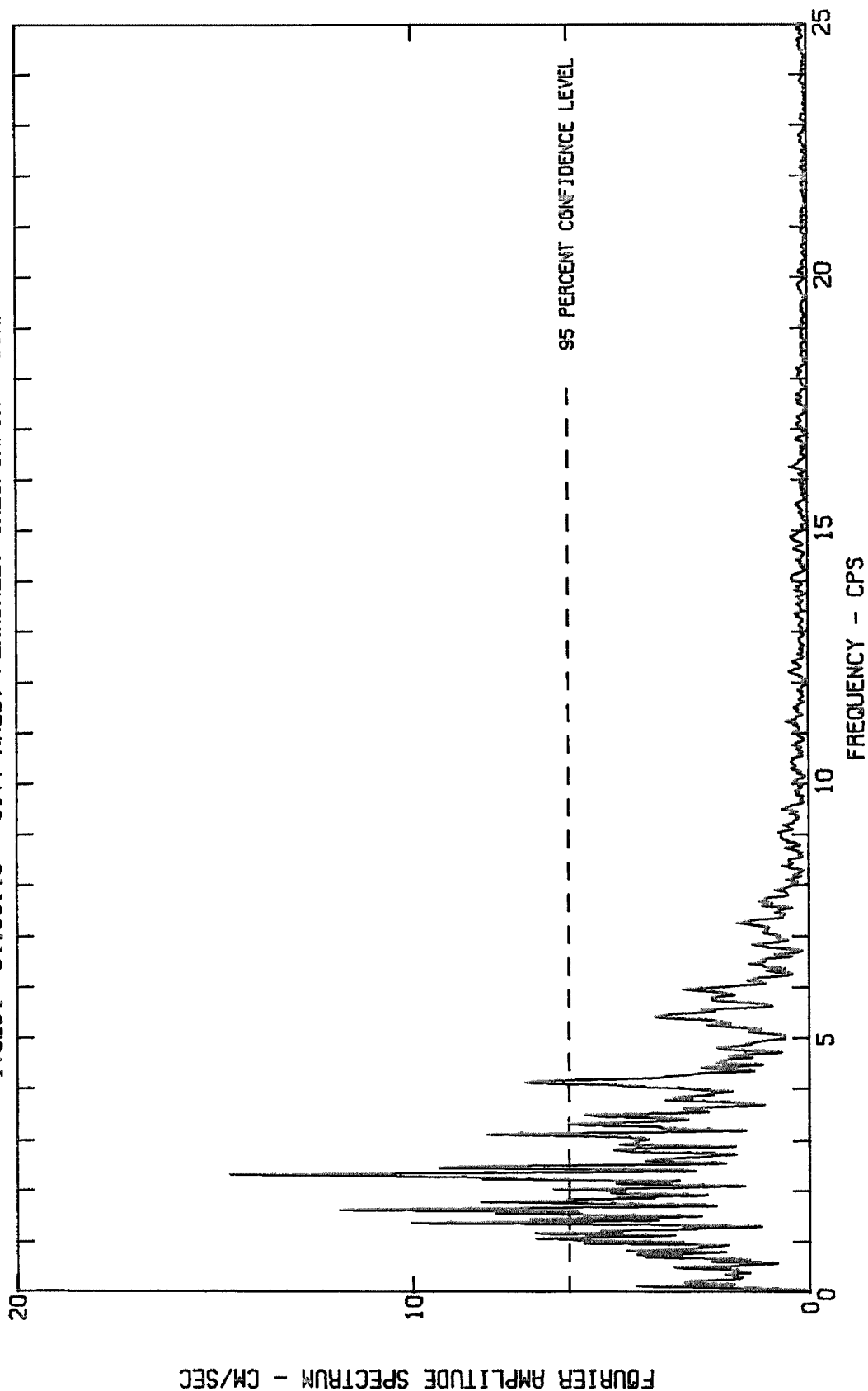
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
EUREKA EARTHQUAKE JULY 6, 1934 - 1449 PST  
IVU294 34.001.0 CITY HALL, FERNDALE, CALIFORNIA COMP N45W



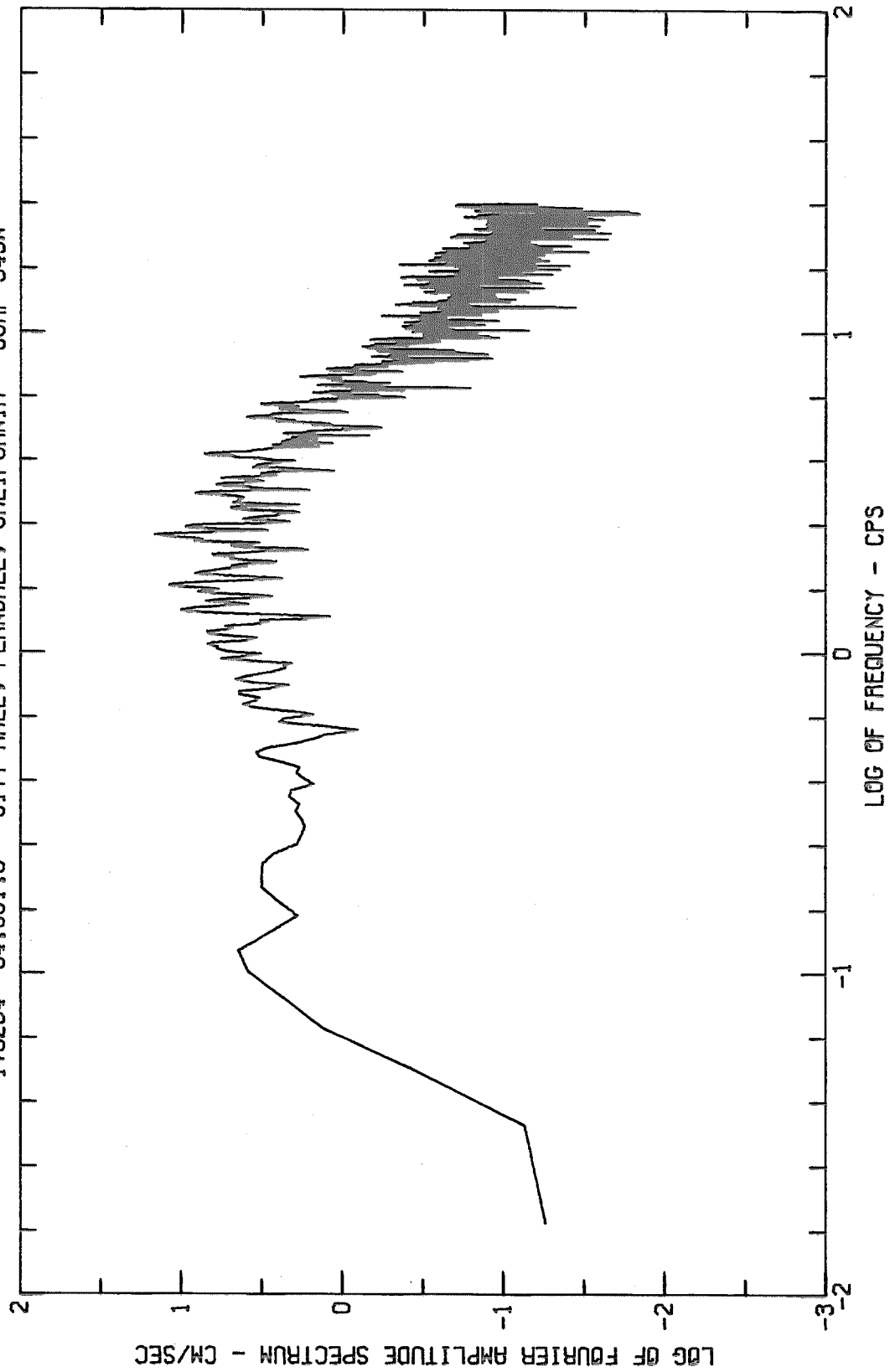
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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1VJ294 34.001.0 CITY HALL, FERDALE, CALIFORNIA COMP N45W



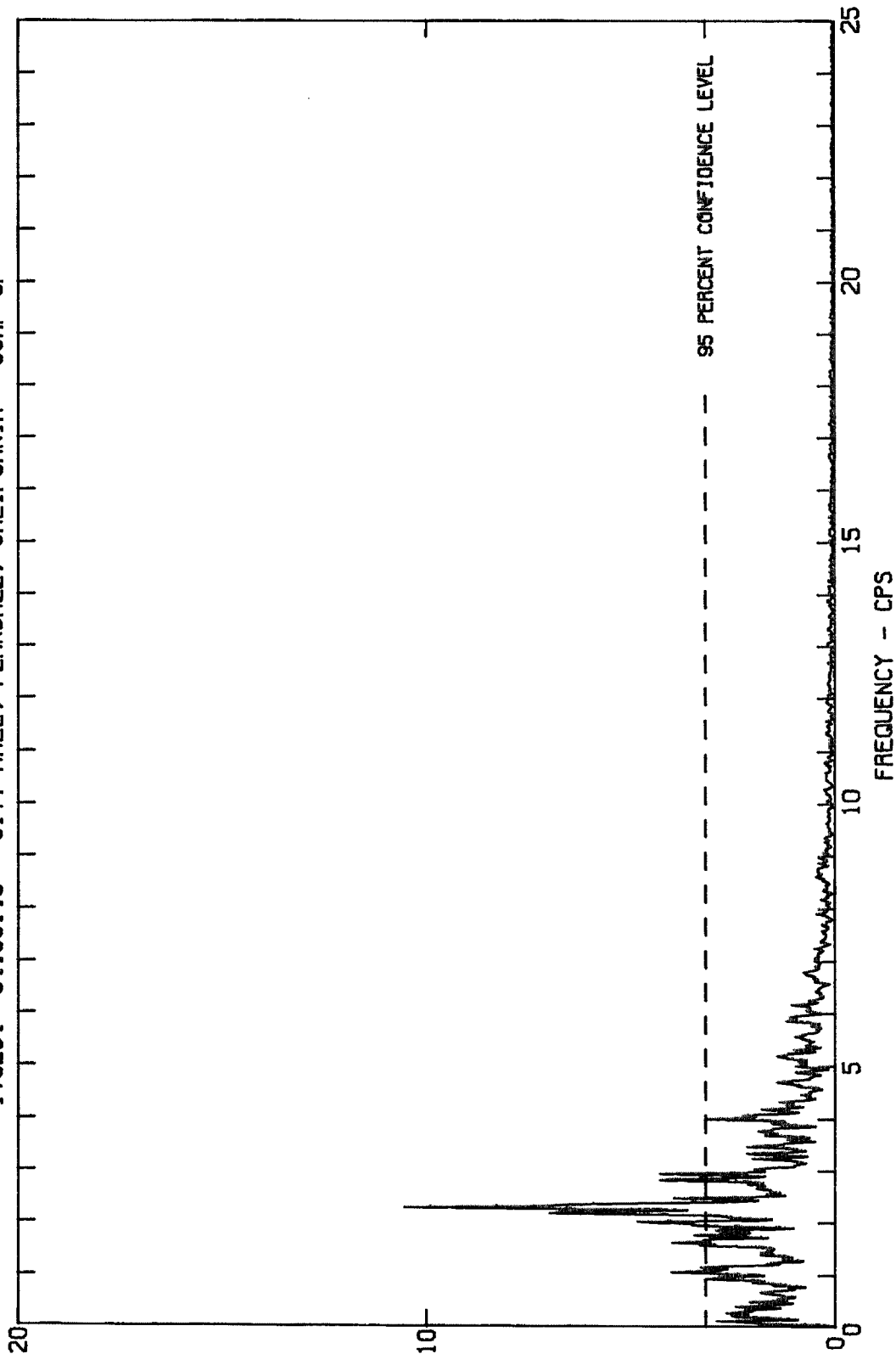
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
EUREKA EARTHQUAKE JULY 6, 1934 - 1449 PST  
IVU294 34.001.0 CITY HALL, FERNDALE, CALIFORNIA COMP S45W



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
EUREKA EARTHQUAKE JULY 6, 1934 - 1449 PST  
1VU294 34.001.0 CITY HALL, FERDALE, CALIFORNIA COMP S45H

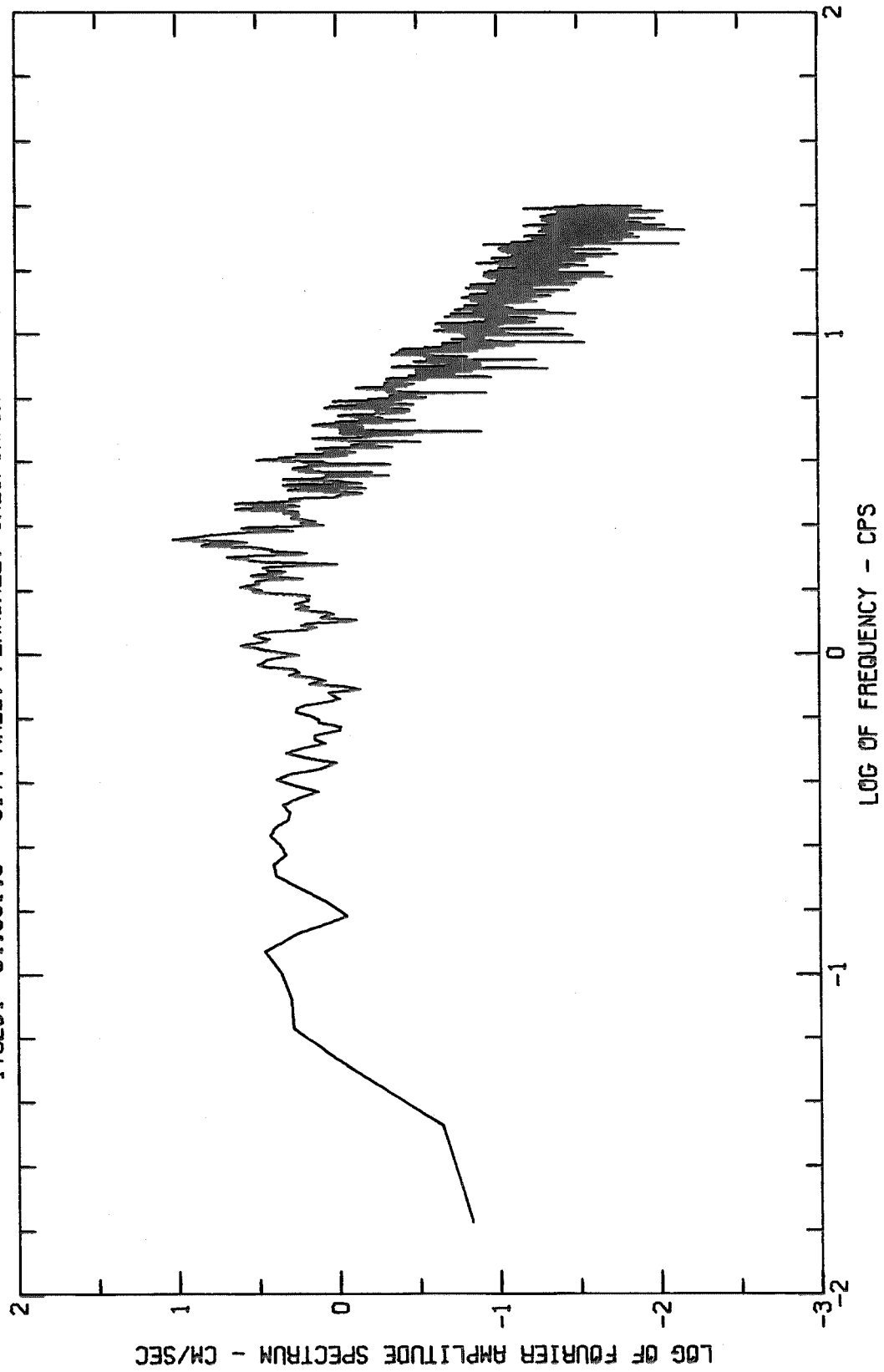


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
EUREKA EARTHQUAKE JULY 6, 1934 - 1449 PST  
IVU294 34.001.0 CITY HALL, FERDALE, CALIFORNIA COMP UP

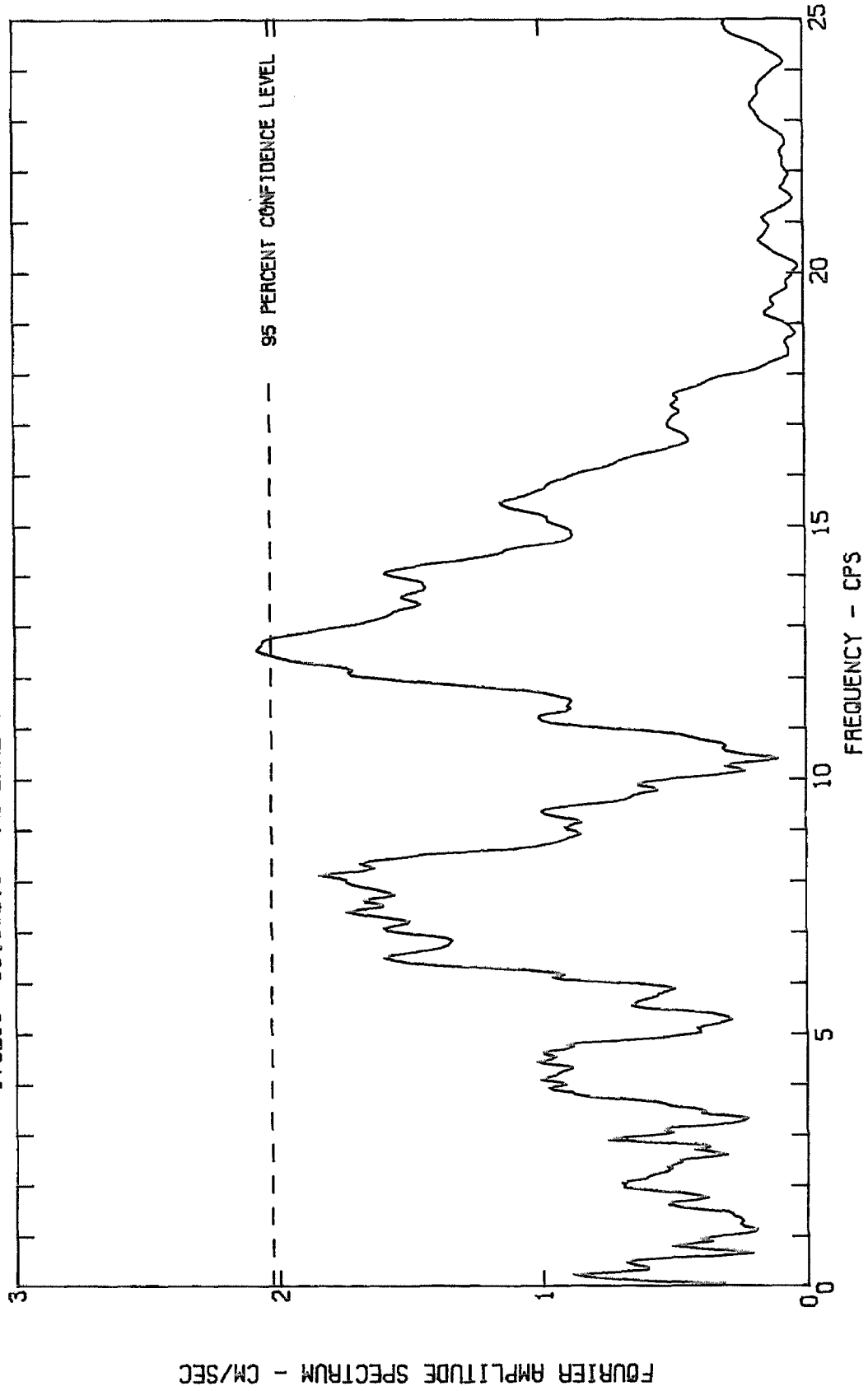




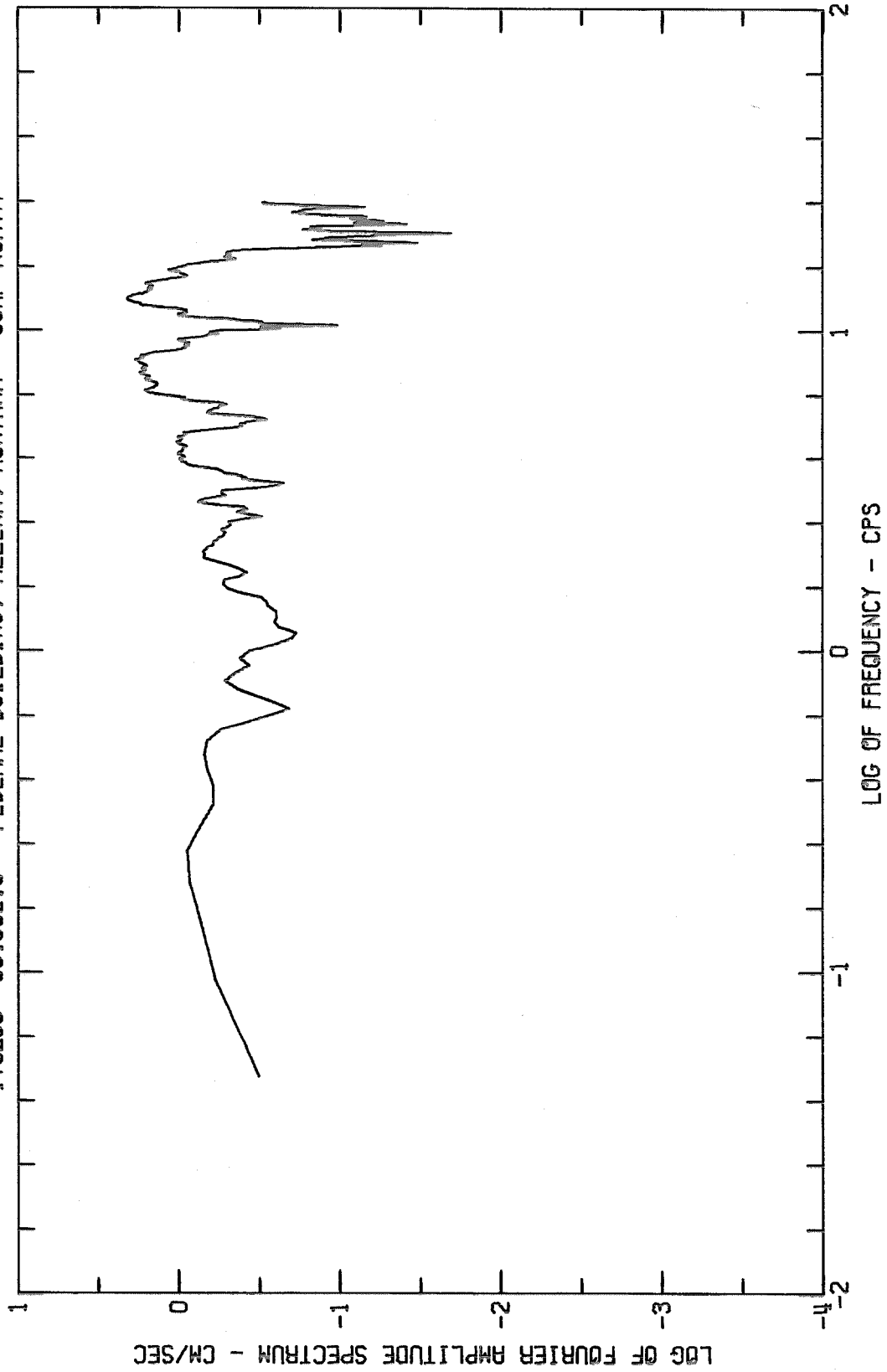
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EUREKA EARTHQUAKE JULY 6, 1934 - 1449 PST  
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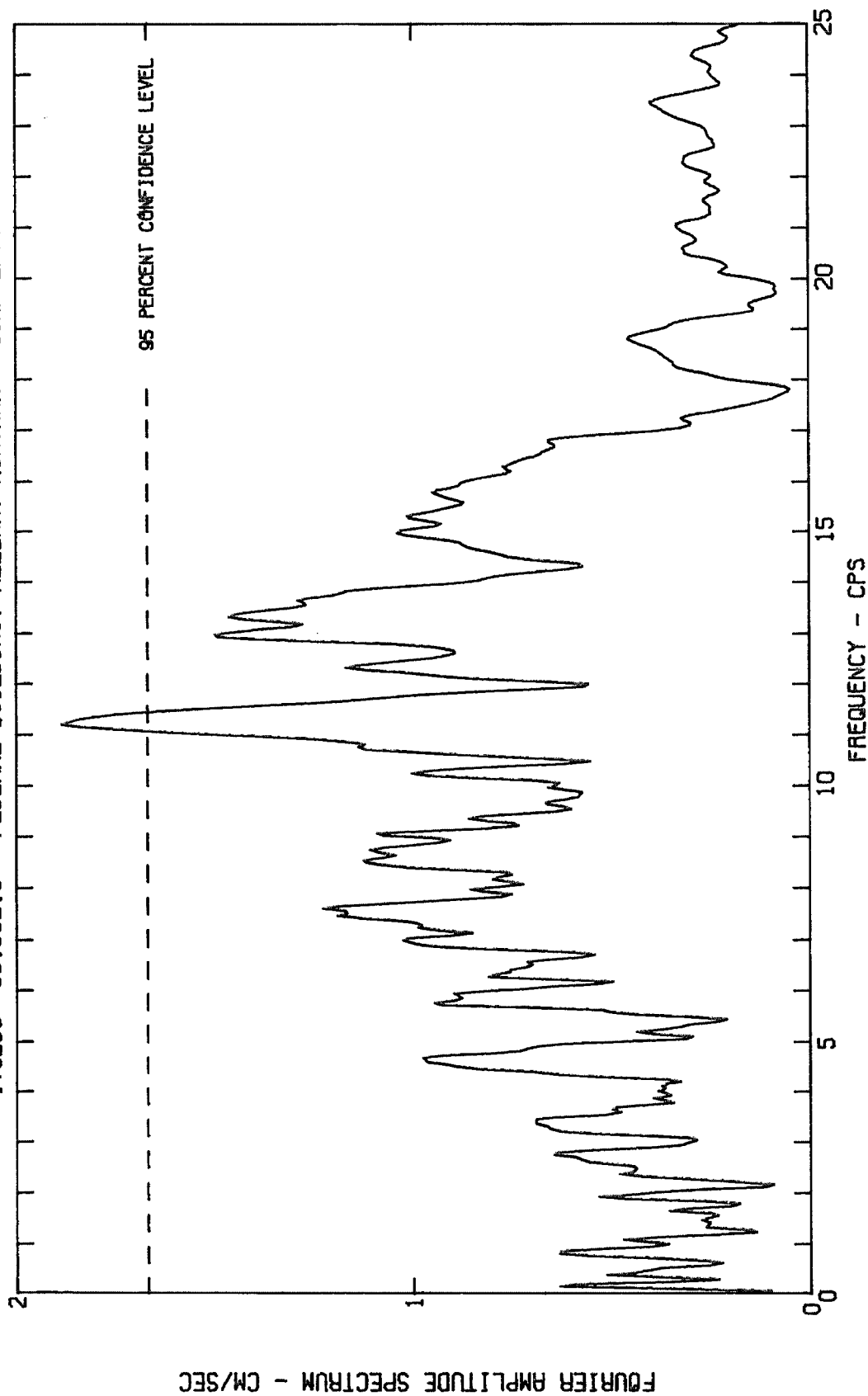
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HELENA, MONTANA, EARTHQUAKE AFTERSHOCK OCT 31, 1935 - 1218 MST  
IVU295 35.002.0 FEDERAL BUILDING, HELENA, MONTANA COMP NORTH



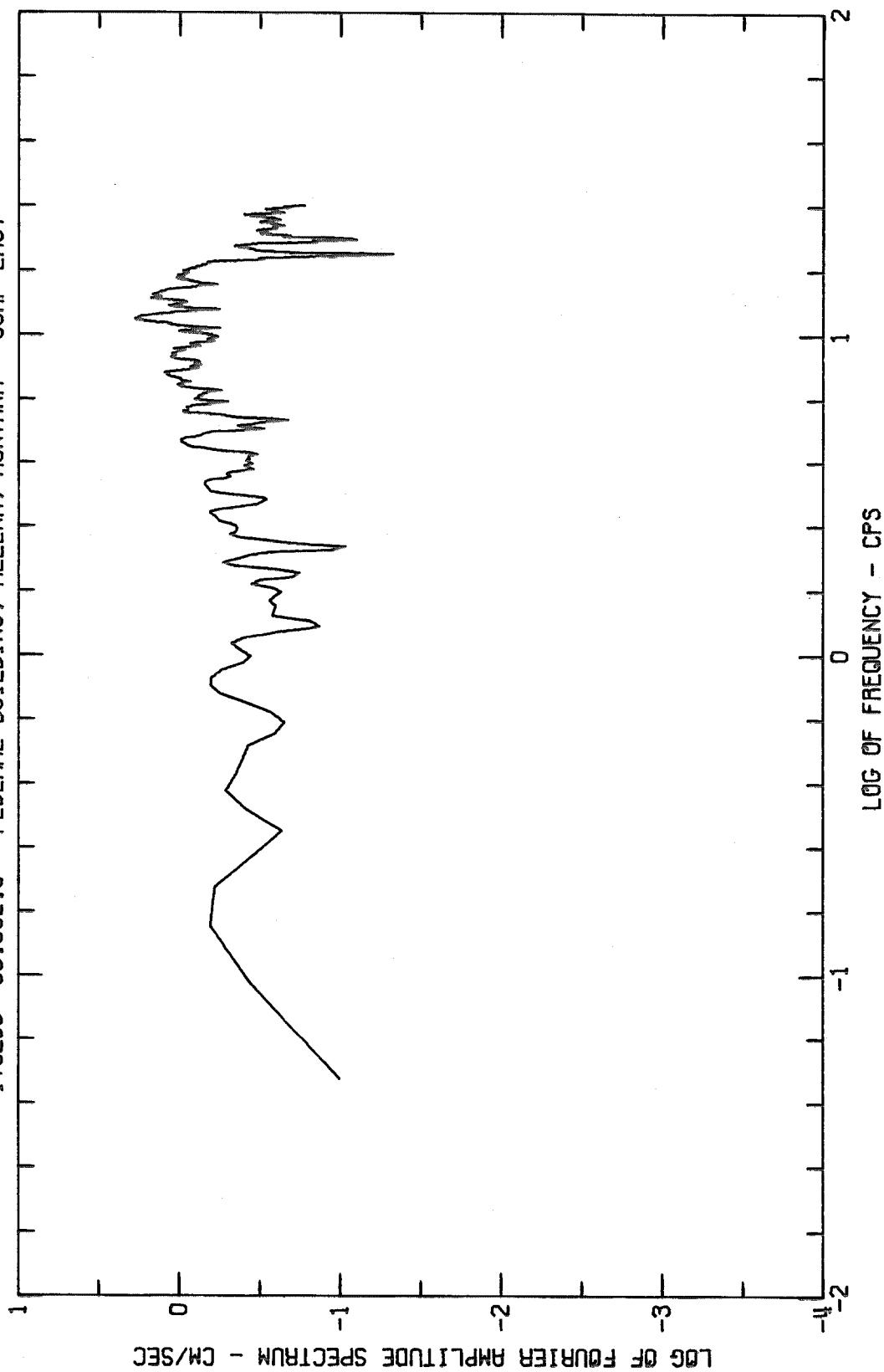
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1VU295 35.002.0 FEDERAL BUILDING, HELENA, MONTANA COMP NORTH



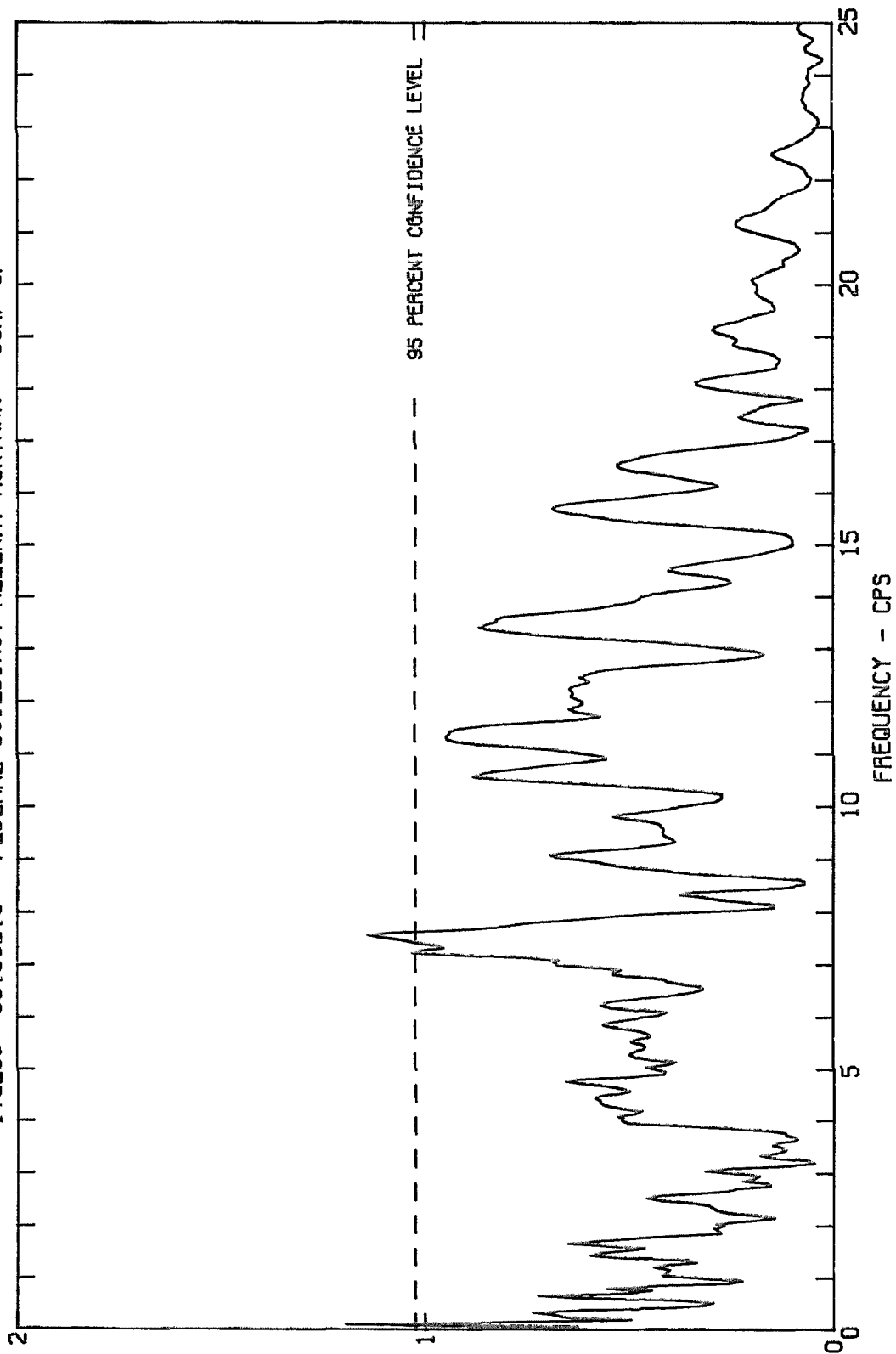
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HELENA, MONTANA, EARTHQUAKE AFTERSHOCK OCT 31, 1935 - 1218 MST  
1VU295 35.002.0 FEDERAL BUILDING, HELENA, MONTANA COMP EAST



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HELENA, MONTANA, EARTHQUAKE AFTERSHOCK OCT 31, 1935 - 1218 MST  
1VU295 35.002.0 FEDERAL BUILDING, HELENA, MONTANA COMP EAST

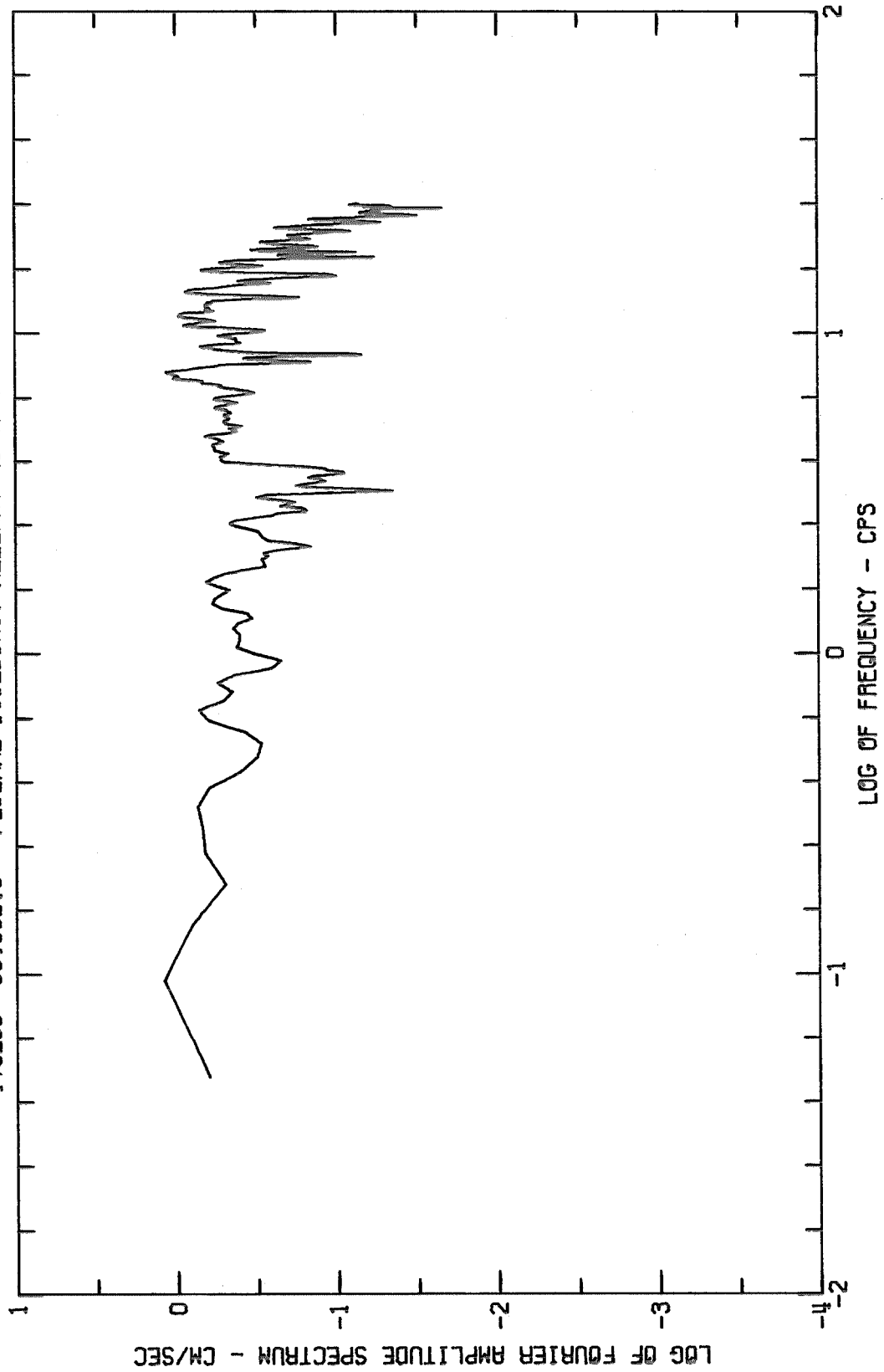


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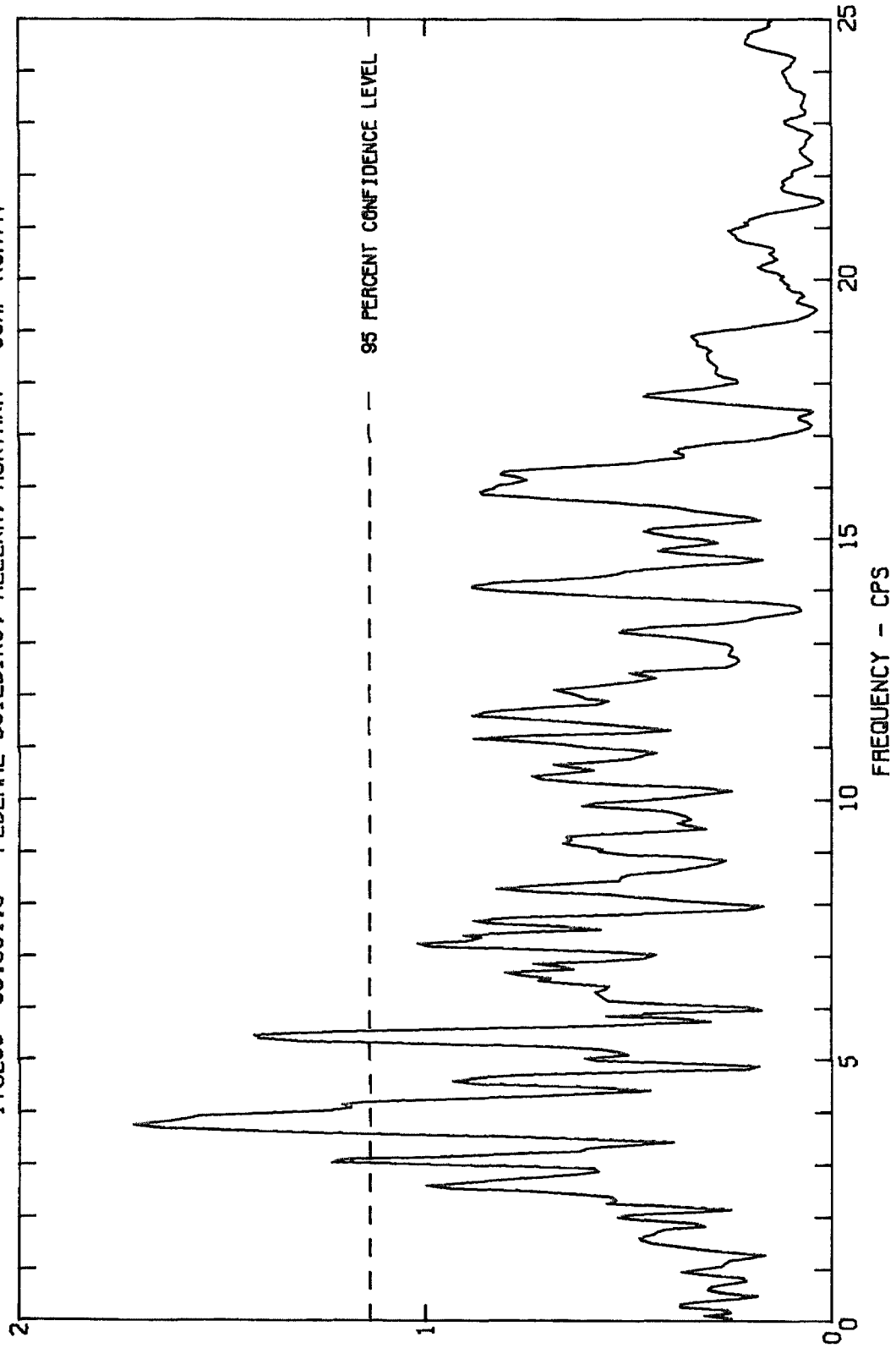


FOURIER AMPLITUDE SPECTRUM - CM/SEC

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HELENA, MONTANA, EARTHQUAKE AFTERSHOCK OCT 31, 1935 - 1218 MST  
1VU295 35.002.0 FEDERAL BUILDING, HELENA, MONTANA COMP UP

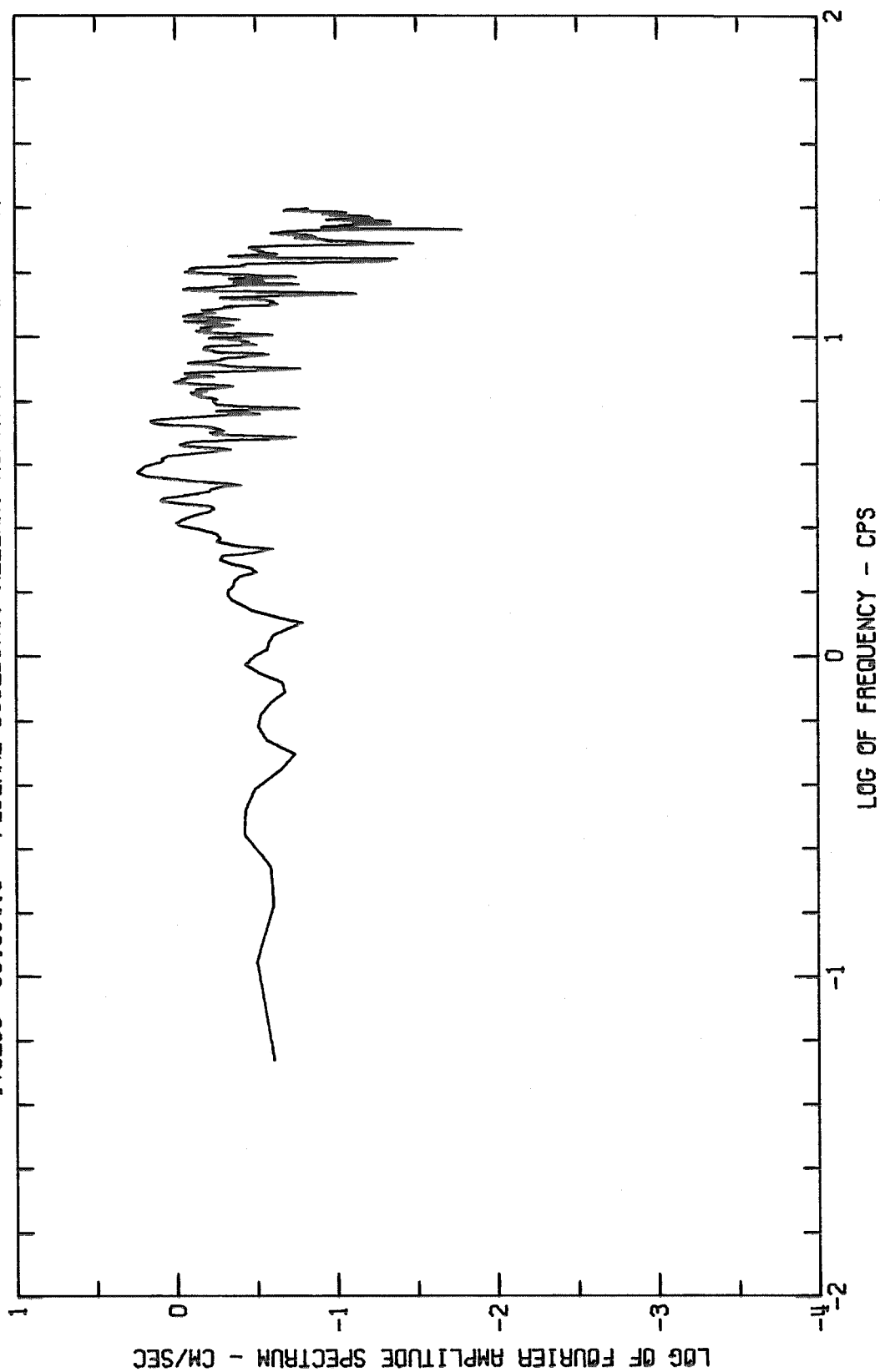


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HELENA, MONTANA, EARTHQUAKE AFTERSHOCK NOV 21, 1935 - 2058 MST  
IVU296 35.004.0 FEDERAL BUILDING, HELENA, MONTANA COMP NORTH

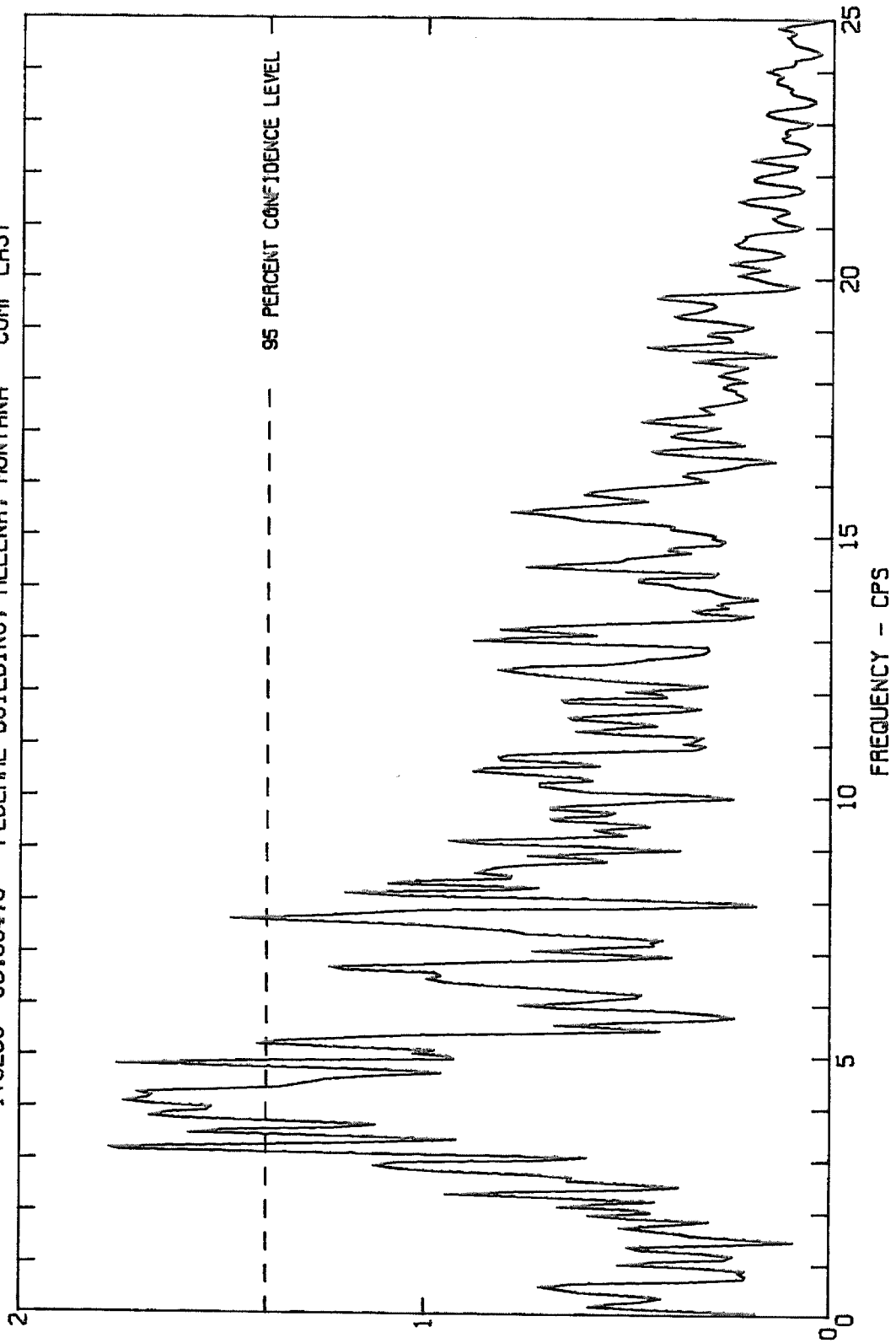




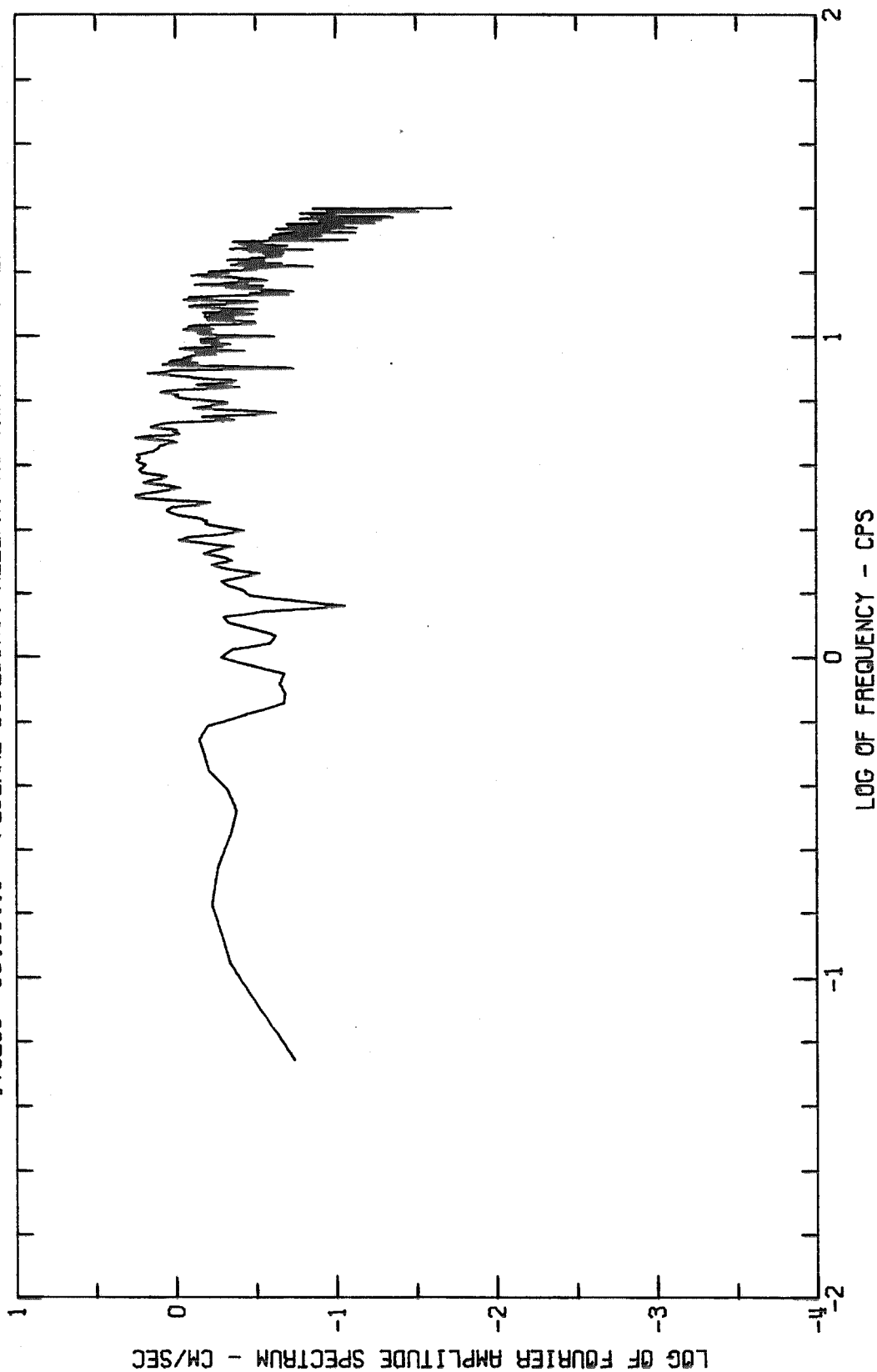
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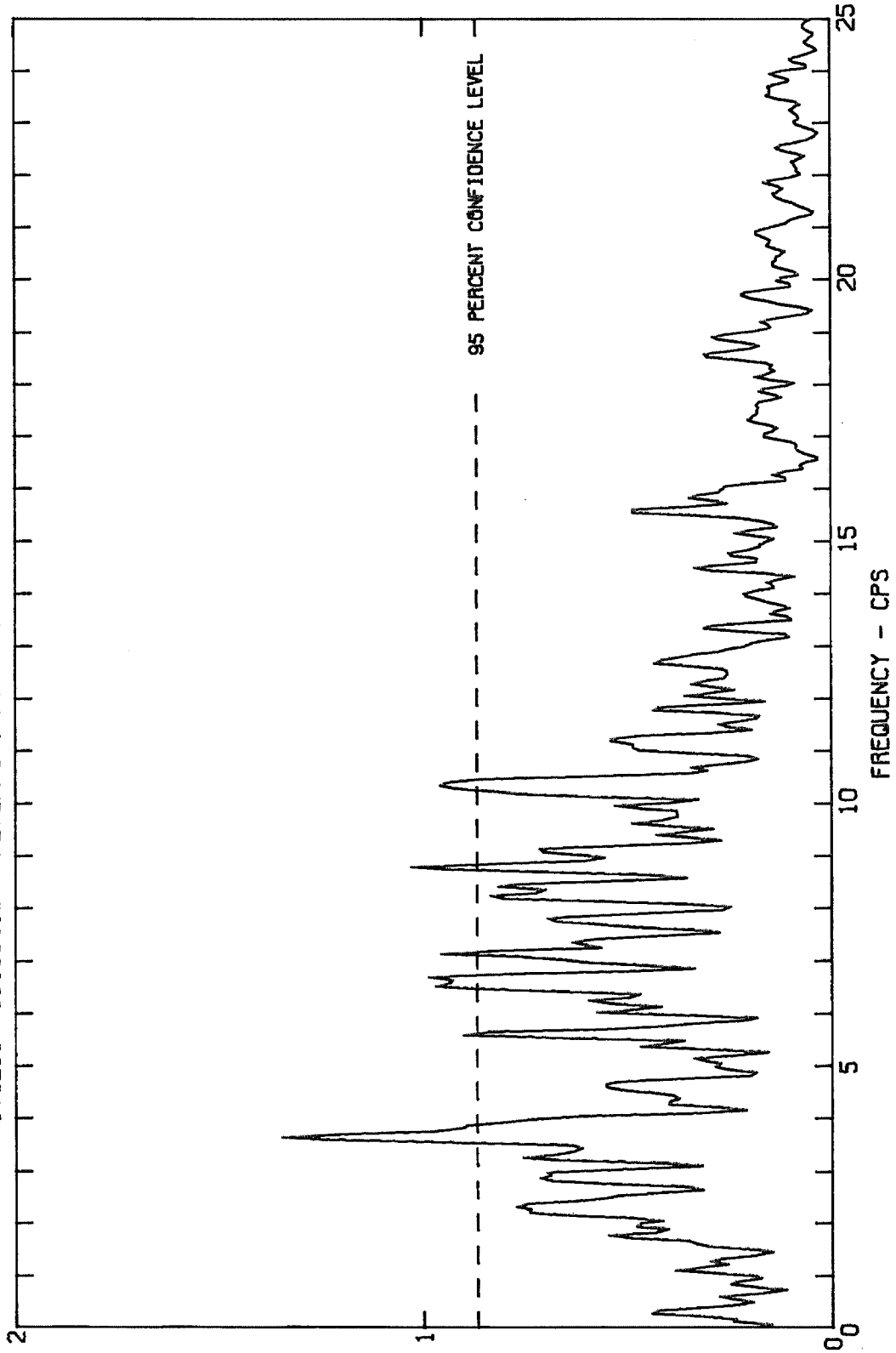
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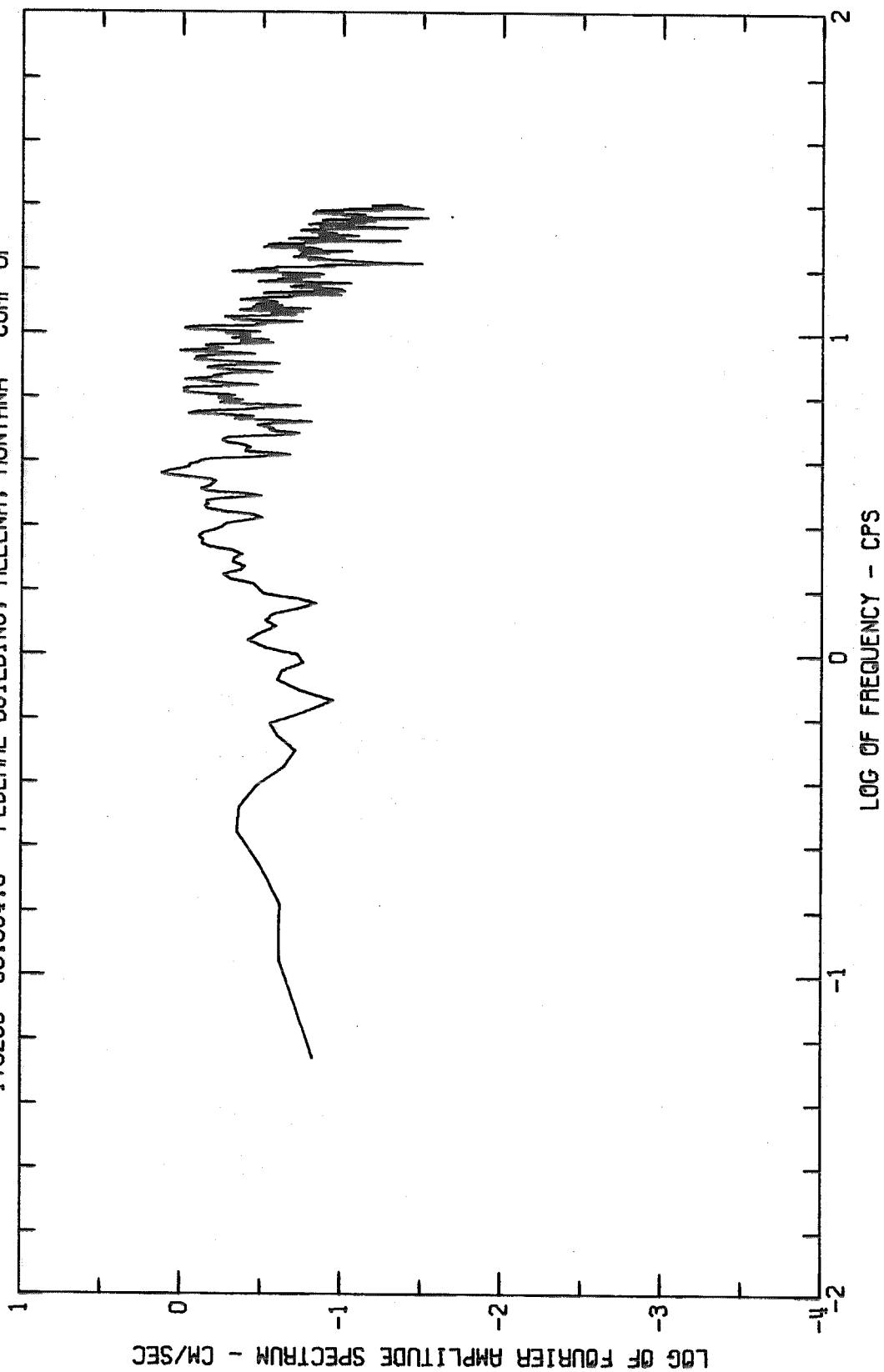
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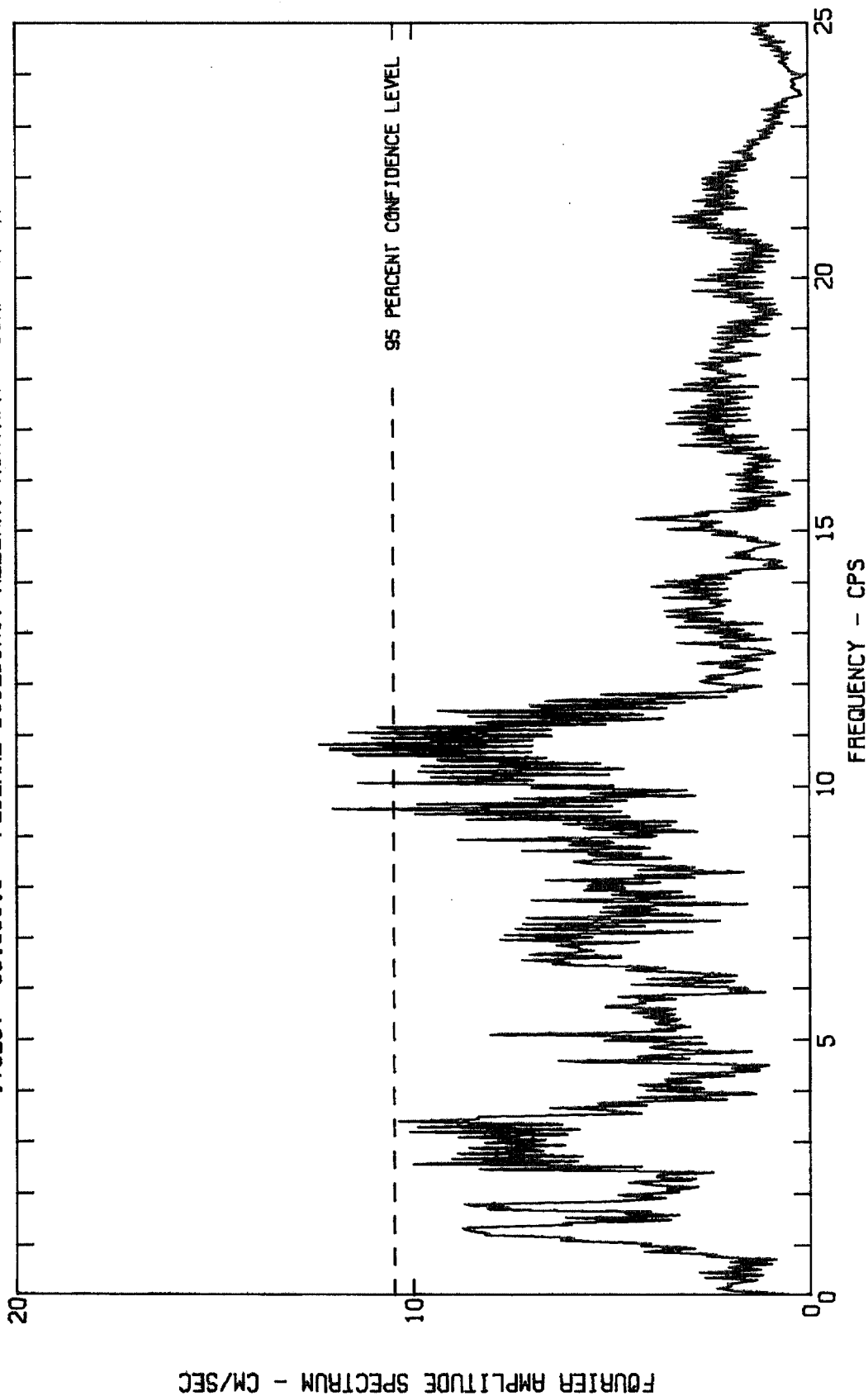
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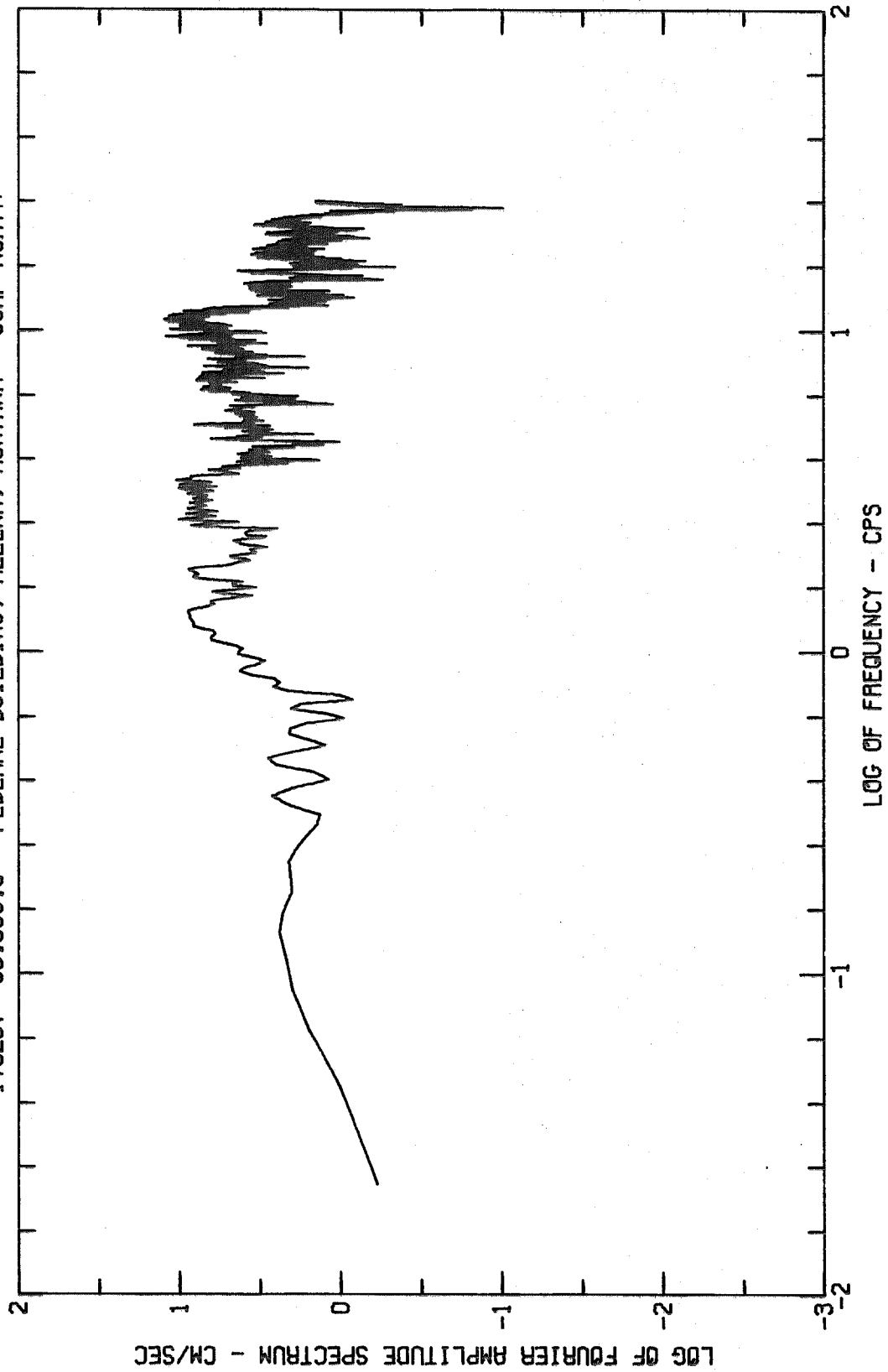
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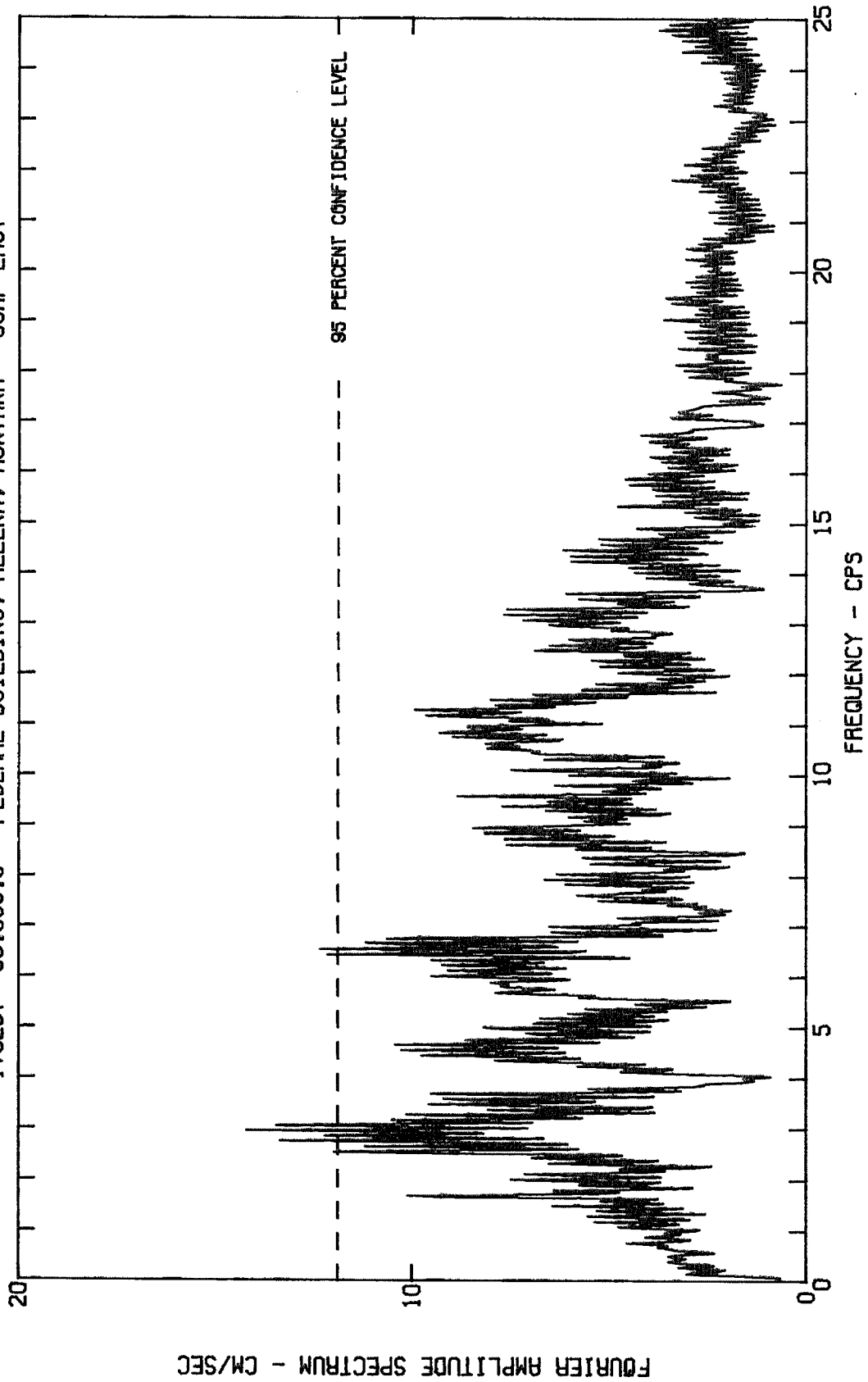
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HELENA, MONTANA, EARTHQUAKE AFTERSHOCK NOV 28, 1935 - 0742 MST  
1VU297 35.003.0 FEDERAL BUILDING, HELENA, MONTANA COMP NORTH



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HELENA, MONTANA, EARTHQUAKE AFTERSHOCK NOV 28, 1935 - 0742 MST  
IVU297 35.003.0 FEDERAL BUILDING, HELENA, MONTANA COMP NORTH

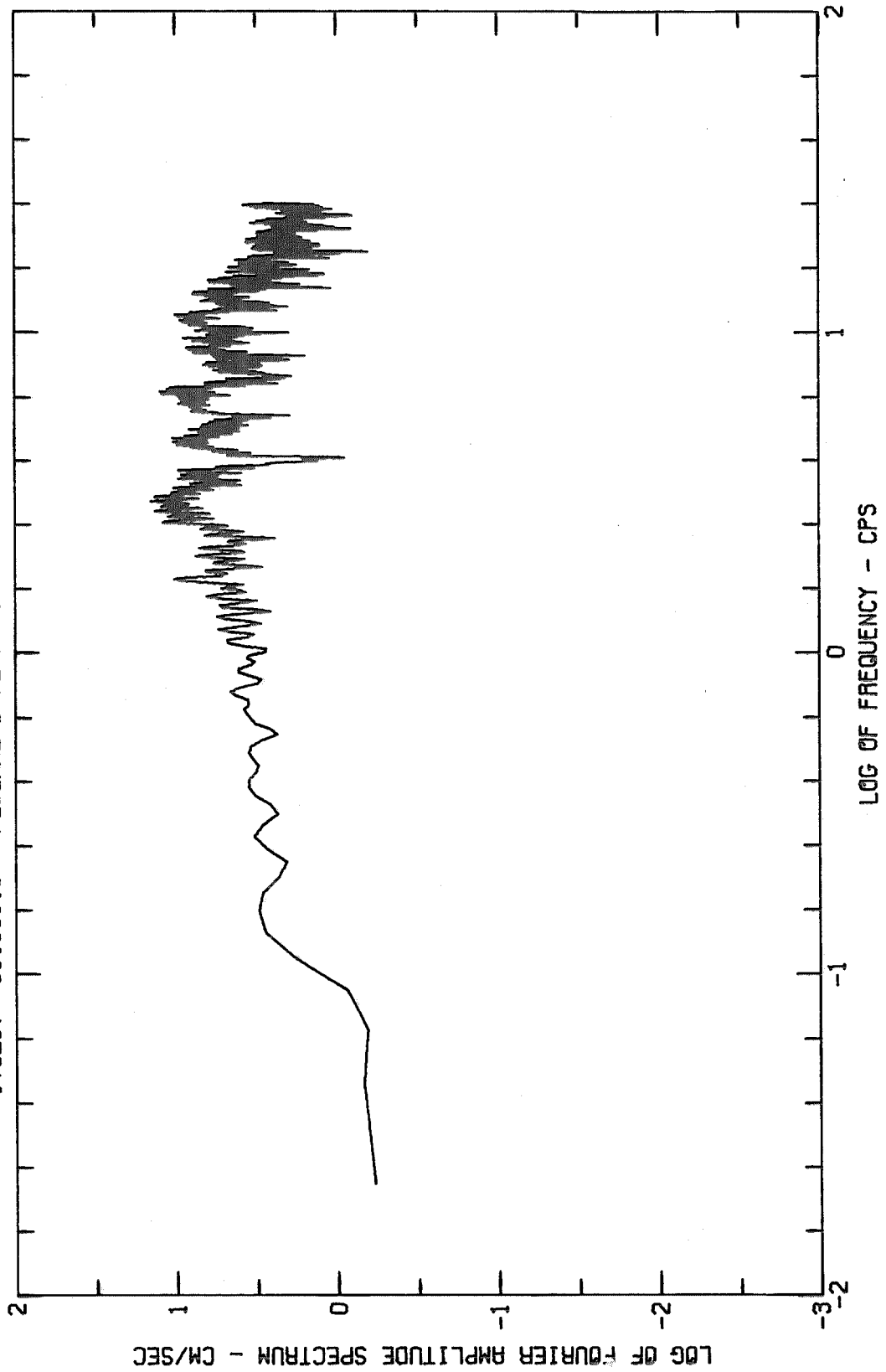


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HELENA, MONTANA, EARTHQUAKE AFTERSHOCK NOV 28, 1935 - 0742 MST  
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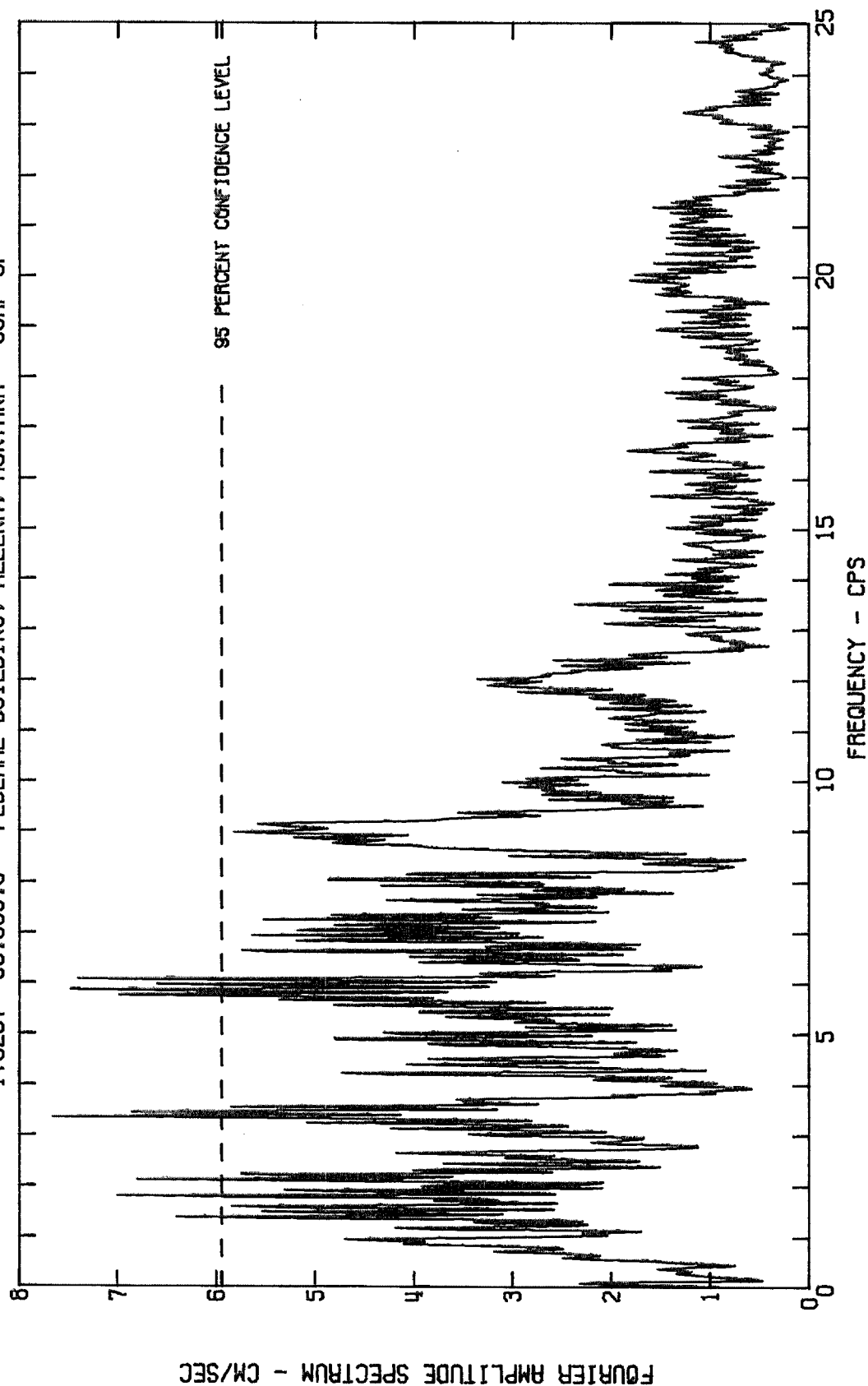




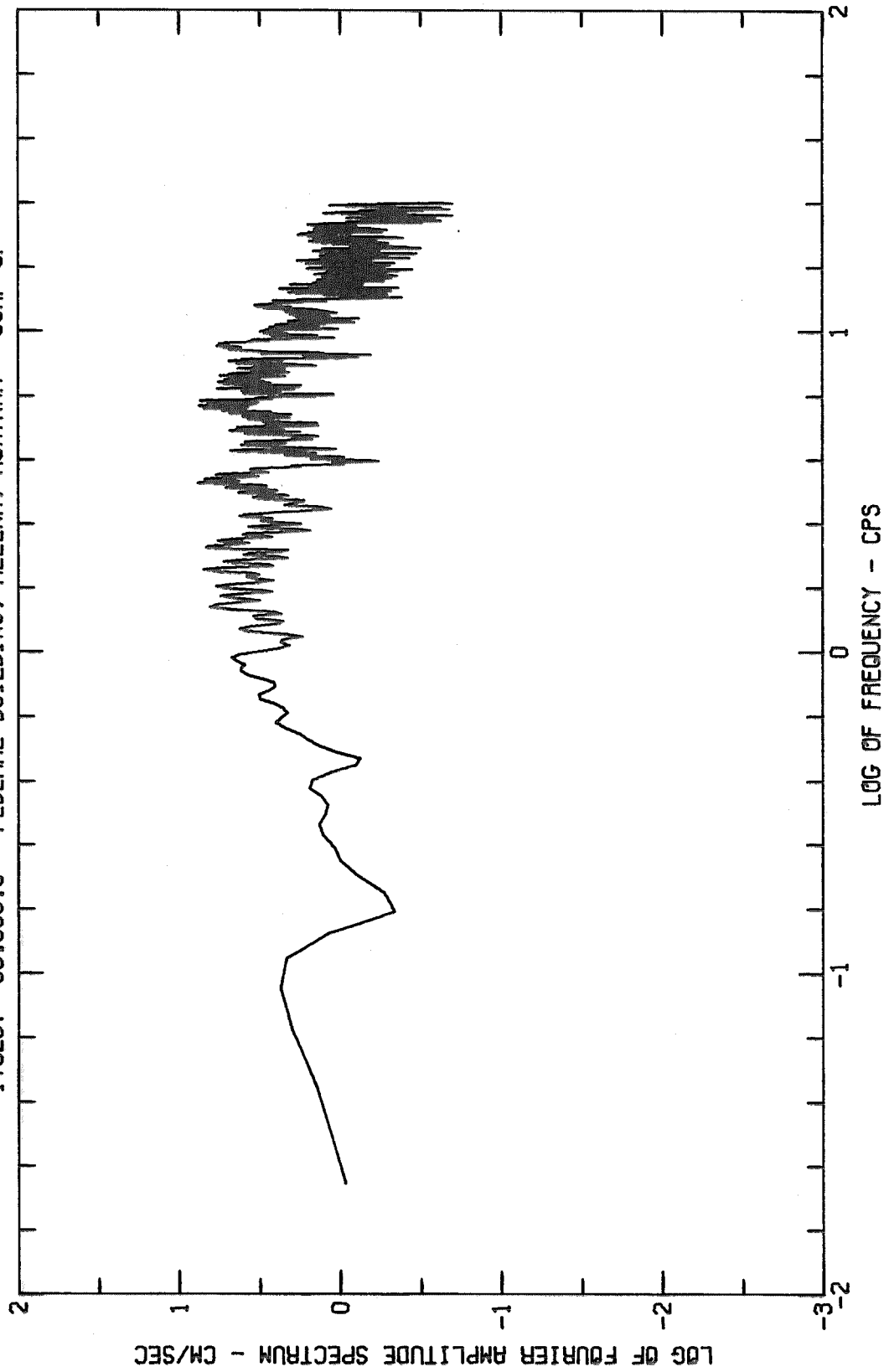
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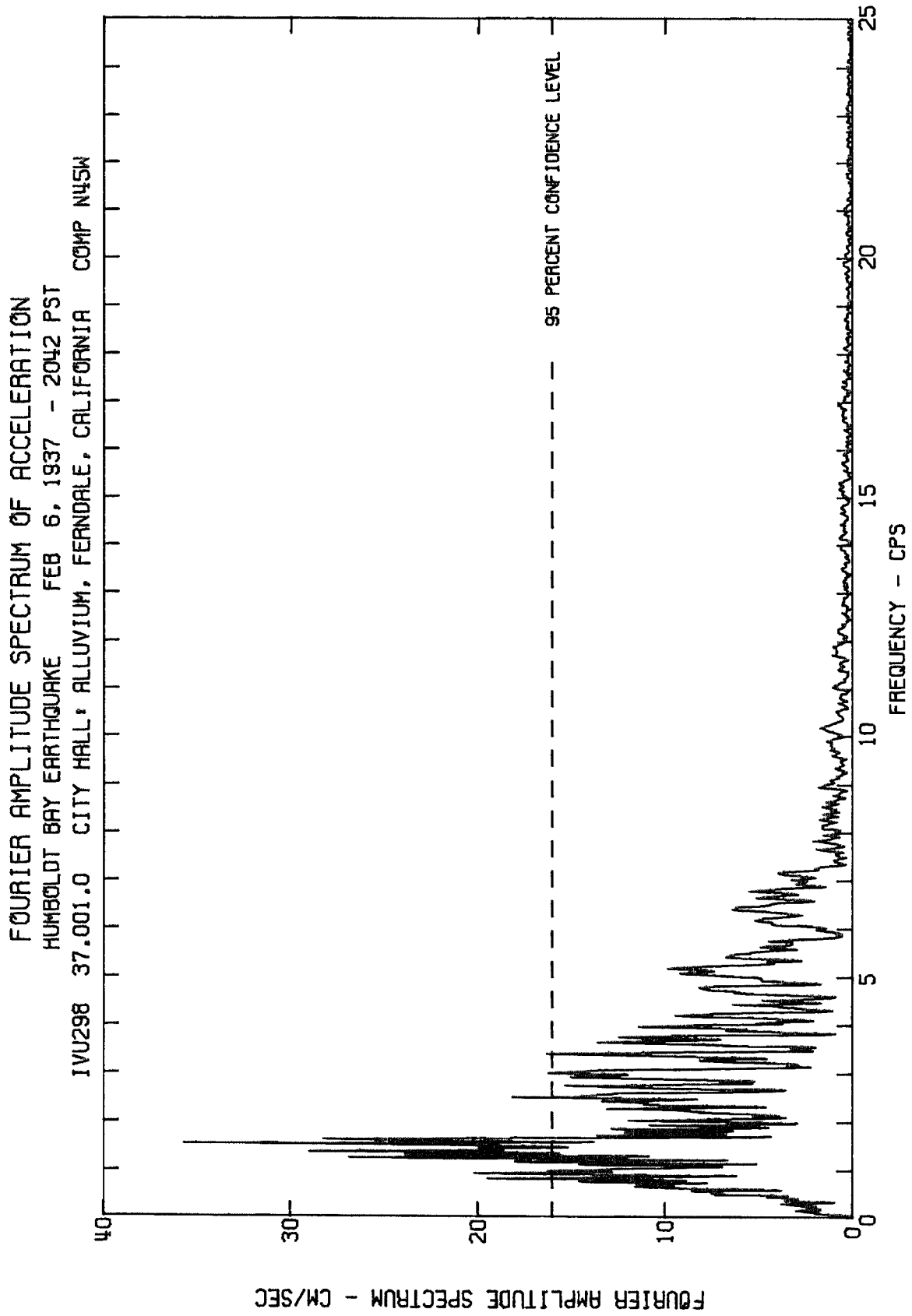


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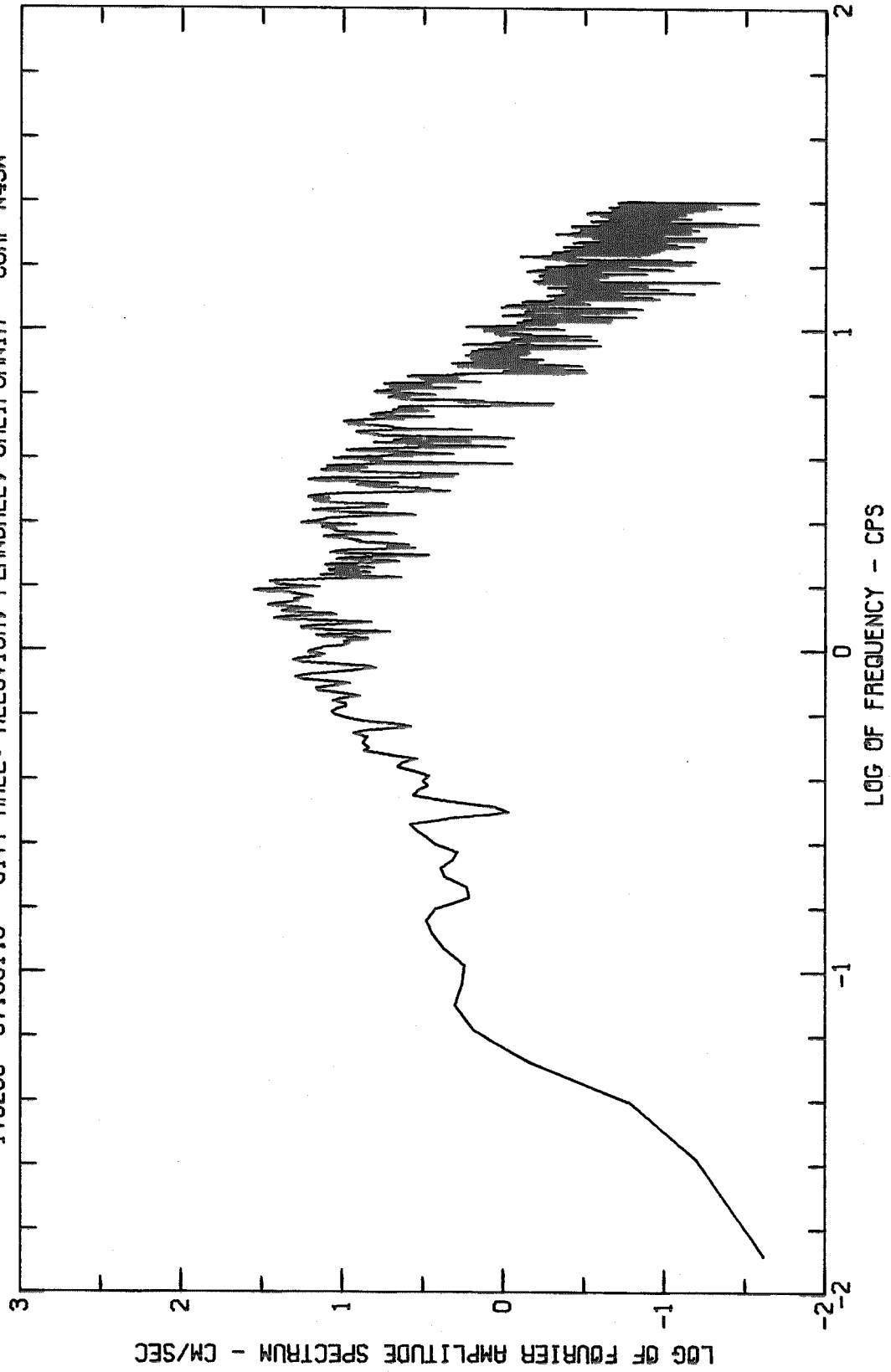


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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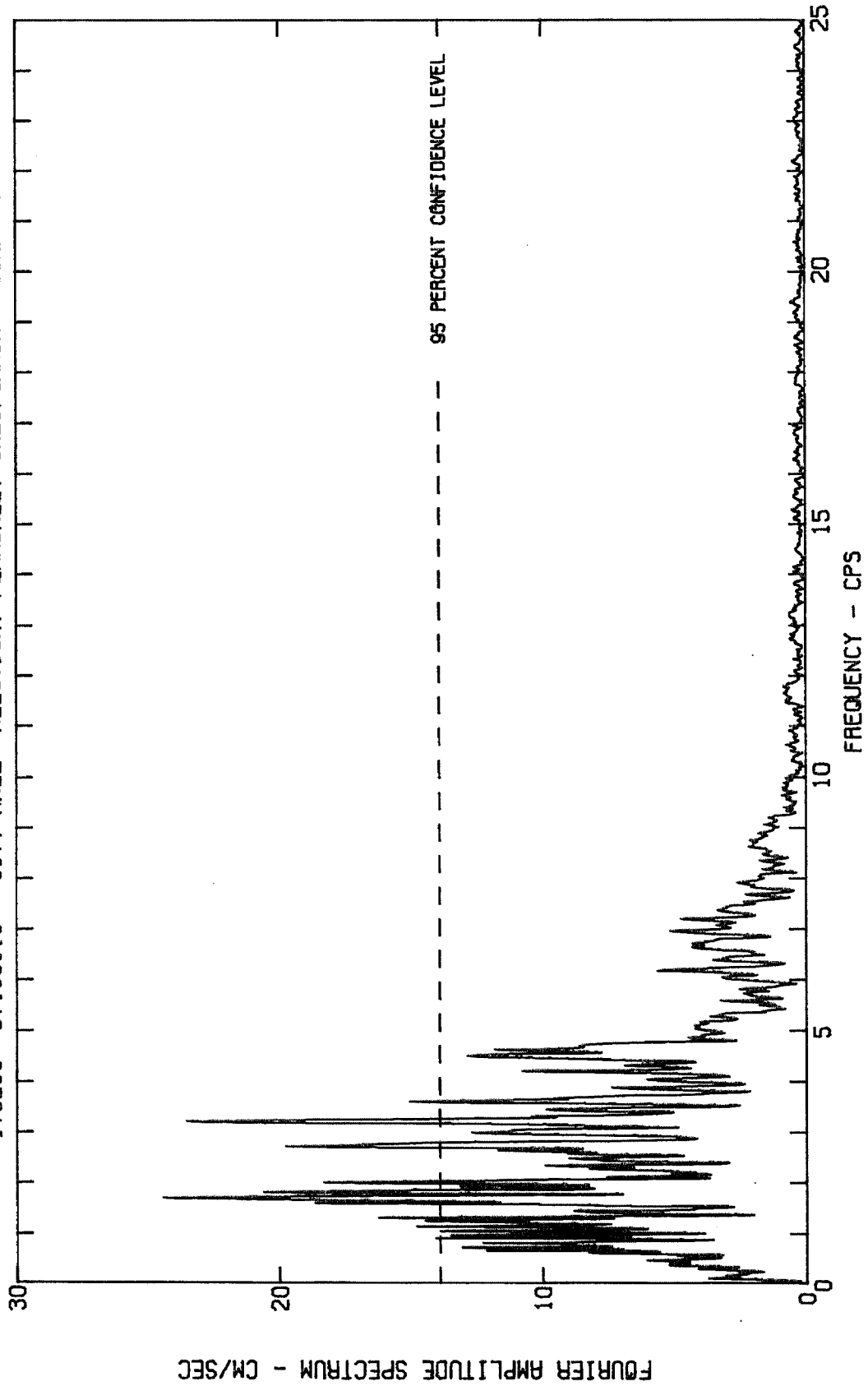
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
HUMBOLDT BAY EARTHQUAKE FEB 6, 1937 - 2042 PST  
IVU298 37.001.0 CITY HALL, ALLUVIUM, FERNDALE, CALIFORNIA COMP N45W



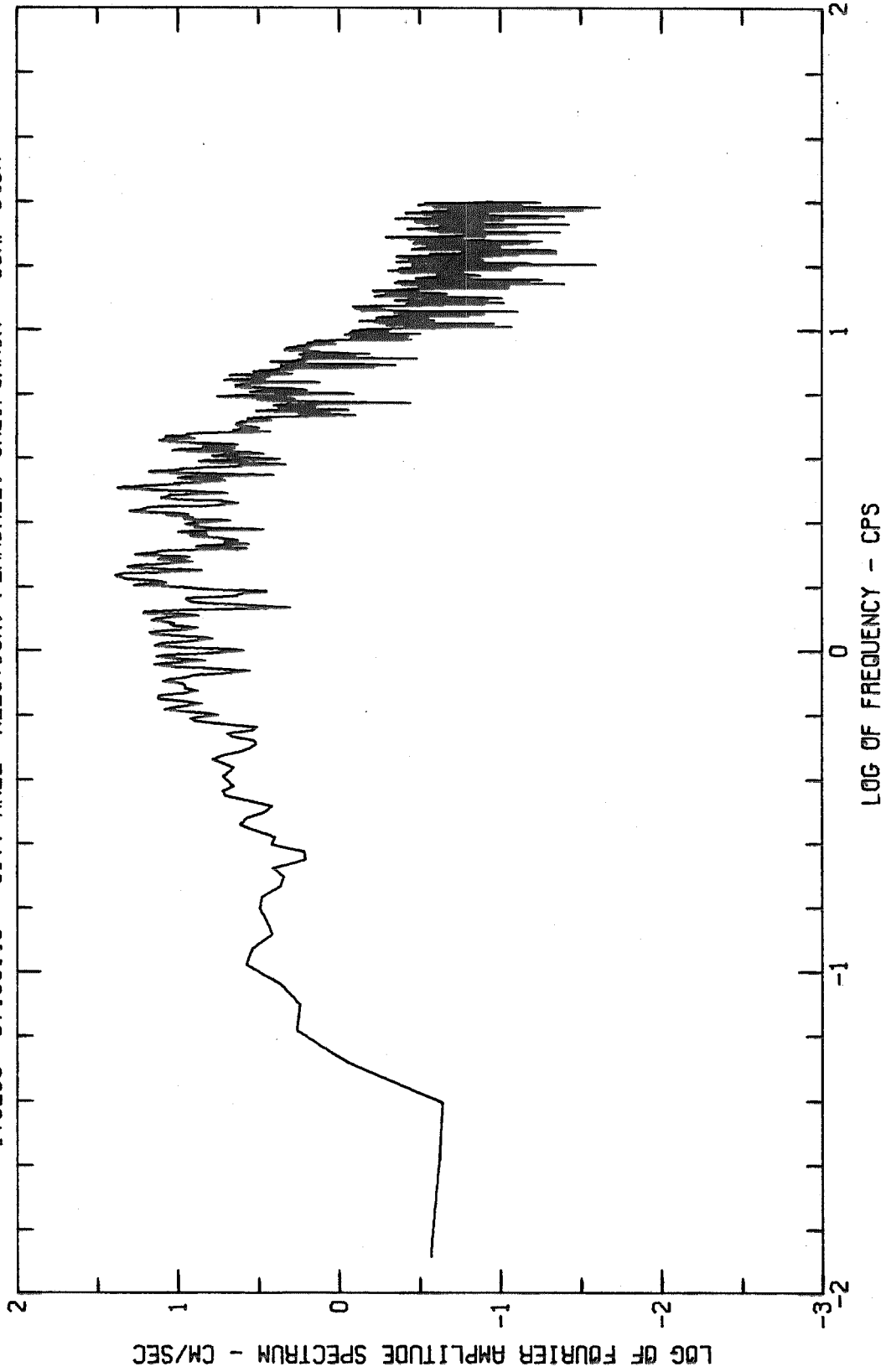
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION

HUMBOLDT BAY EARTHQUAKE FEB 6, 1937 - 2042 PST

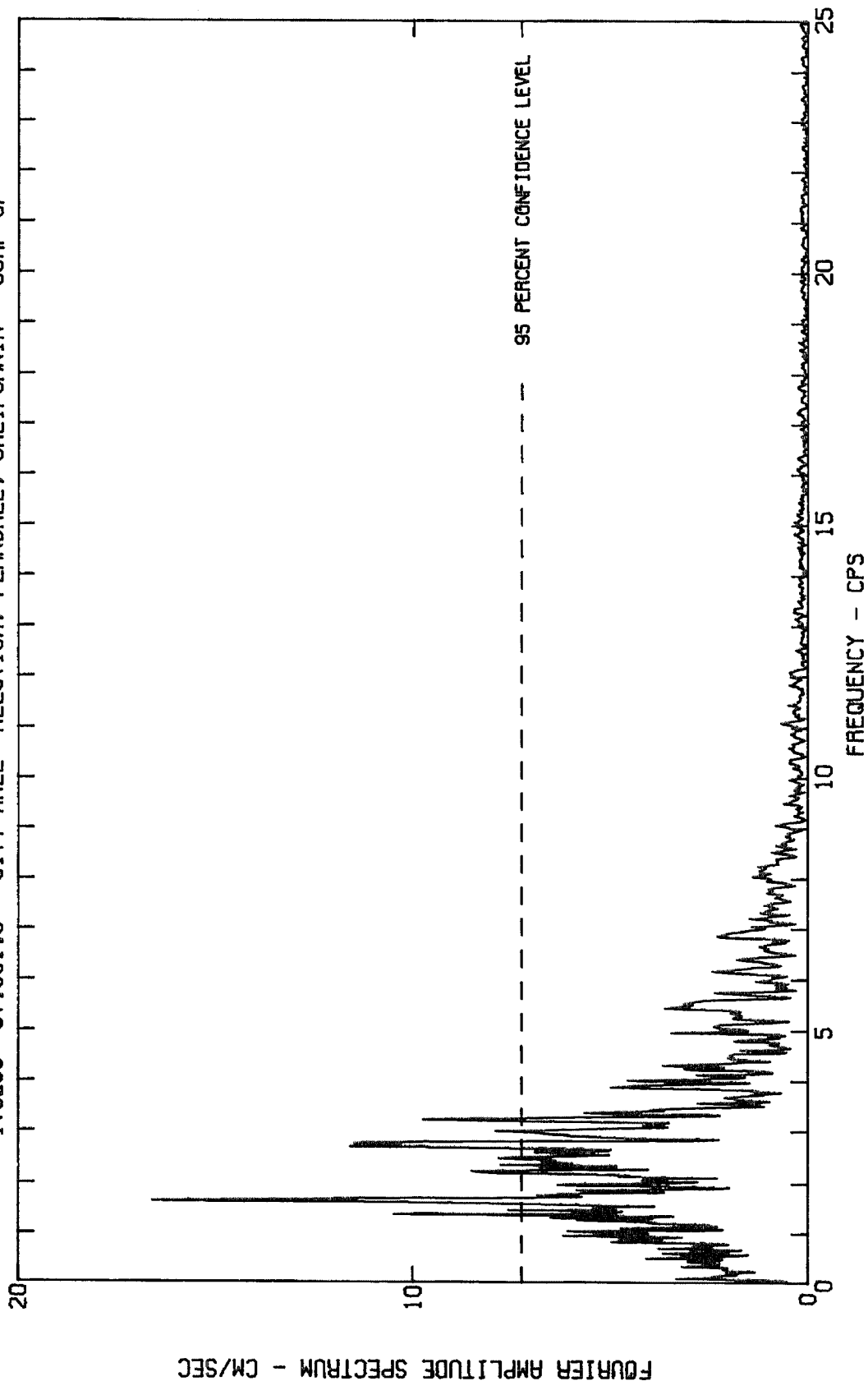
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FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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IVU298 37.001.0 CITY HALL, ALLUVIUM, FERNDALE, CALIFORNIA COMP S45W

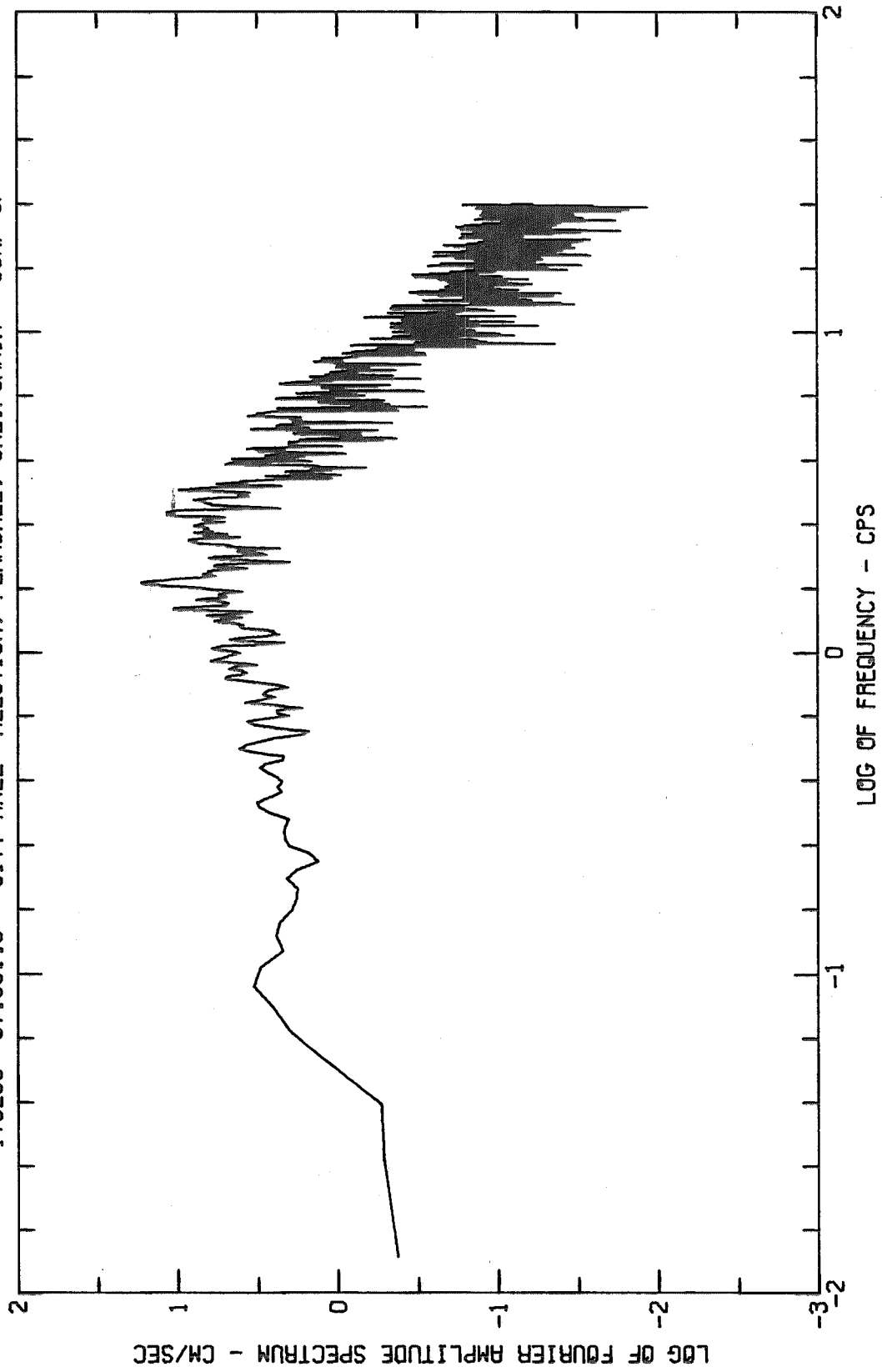


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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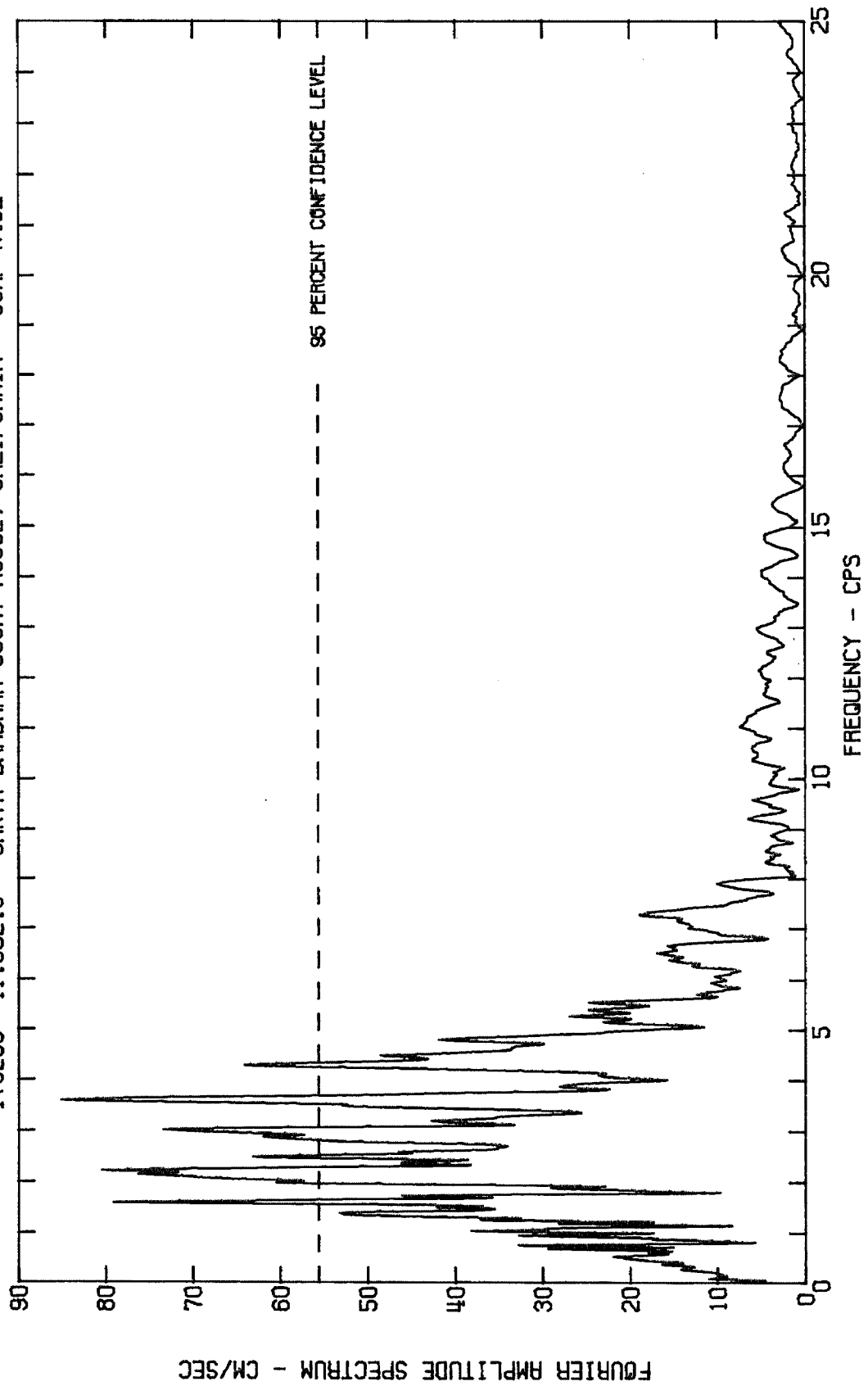




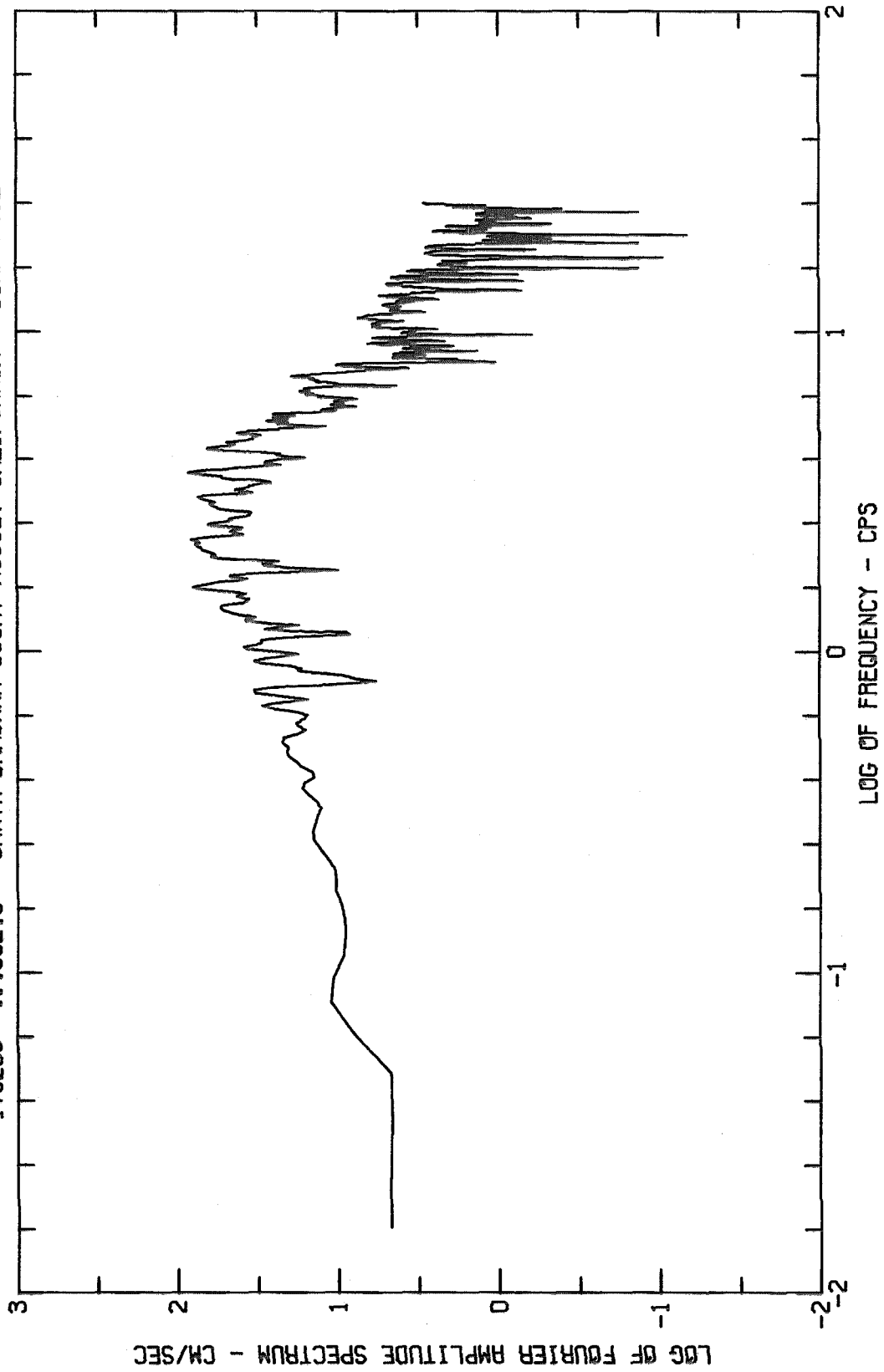
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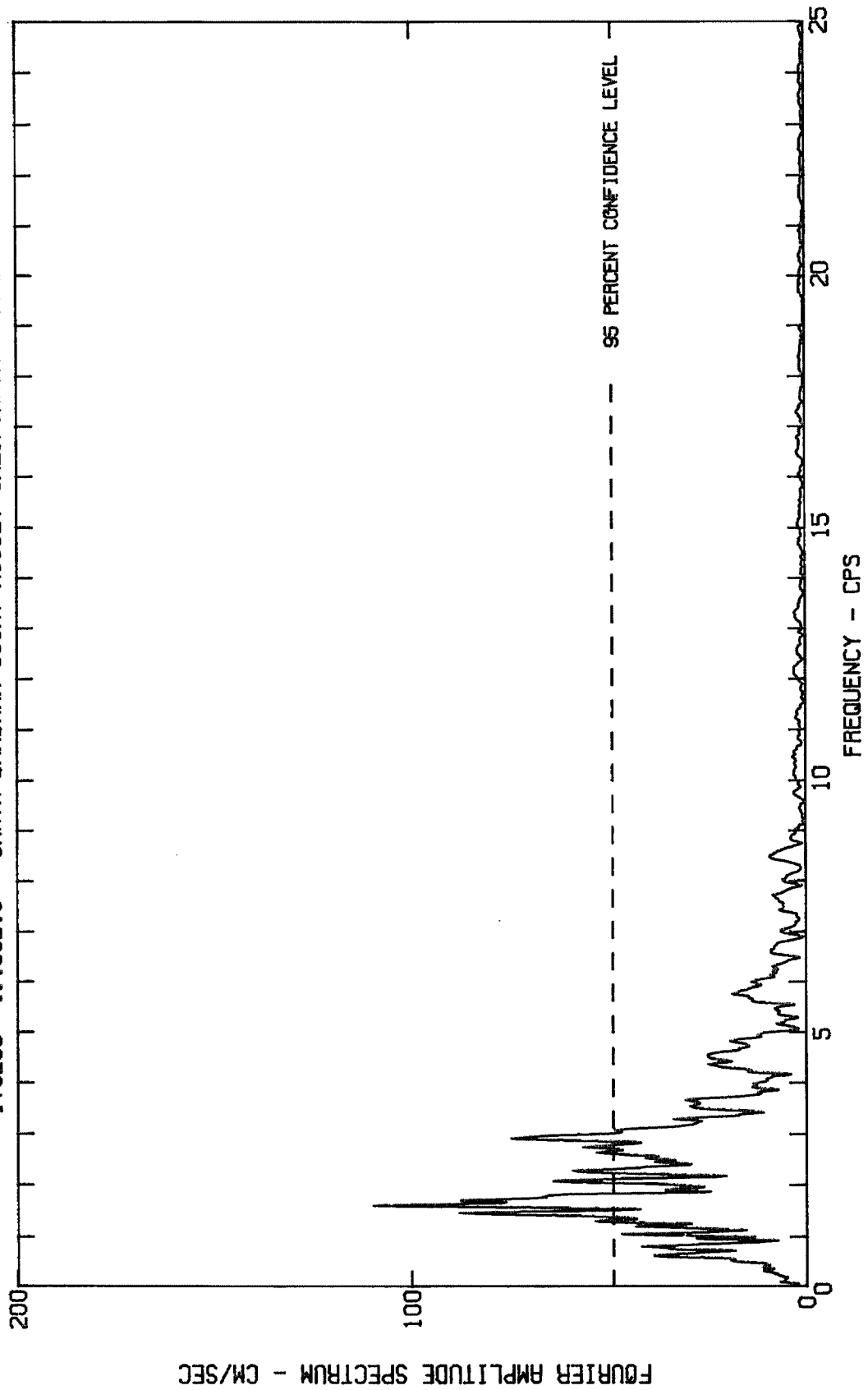
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
SANTA BARBARA EARTHQUAKE JUN 30, 1941 - 2351 PST  
IVU299 41.002.0 SANTA BARBARA COURT HOUSE, CALIFORNIA COMP N45E



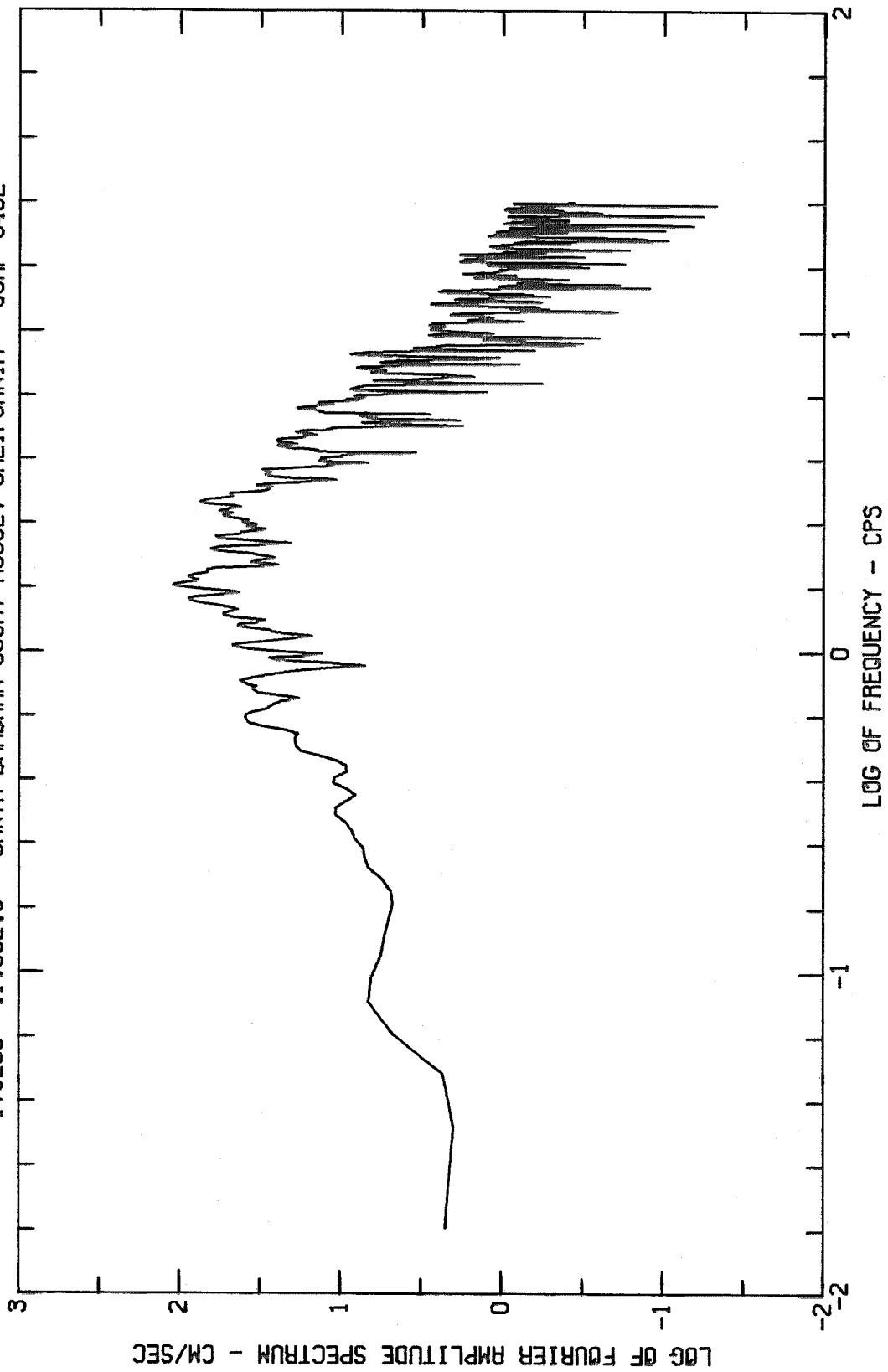
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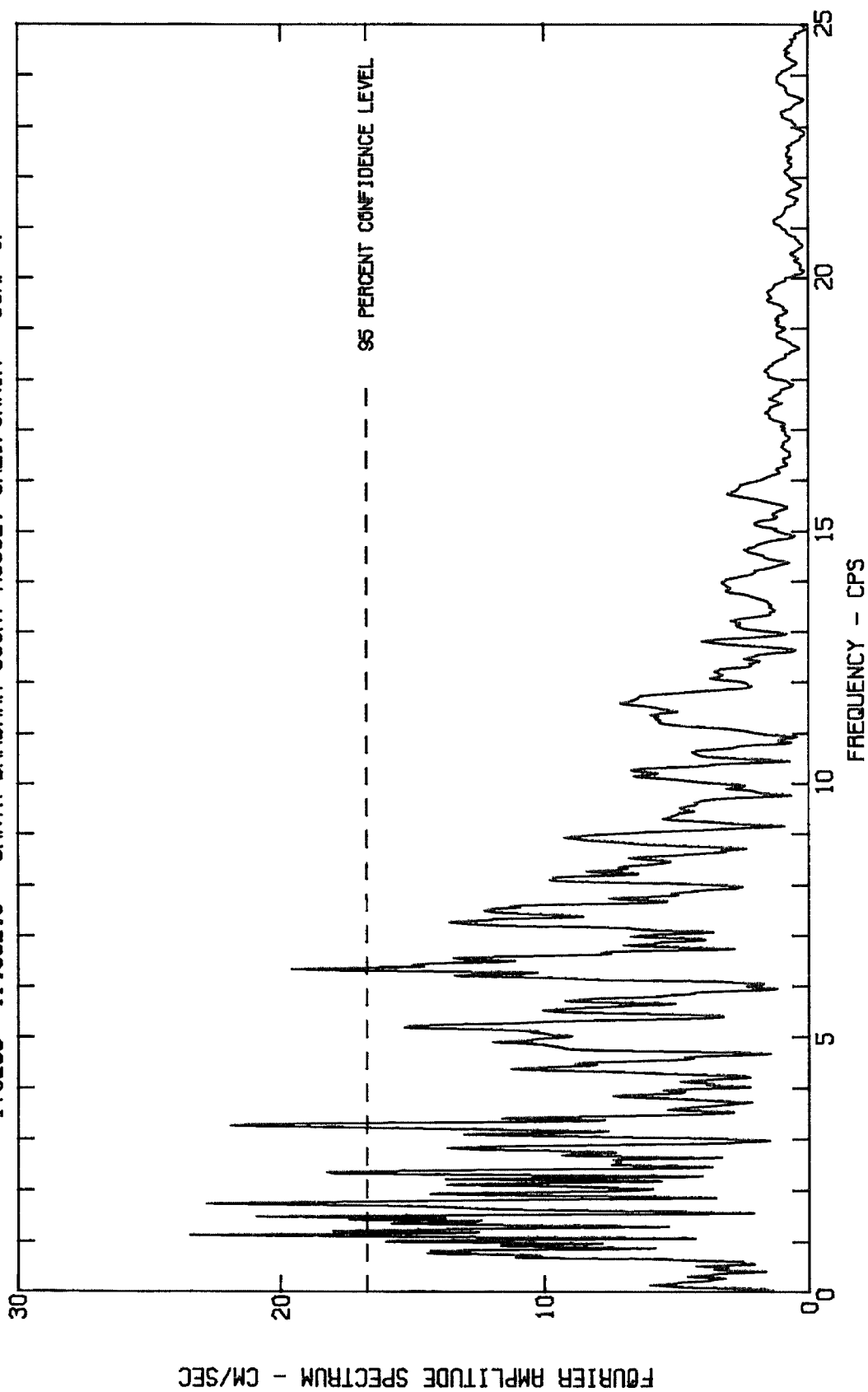
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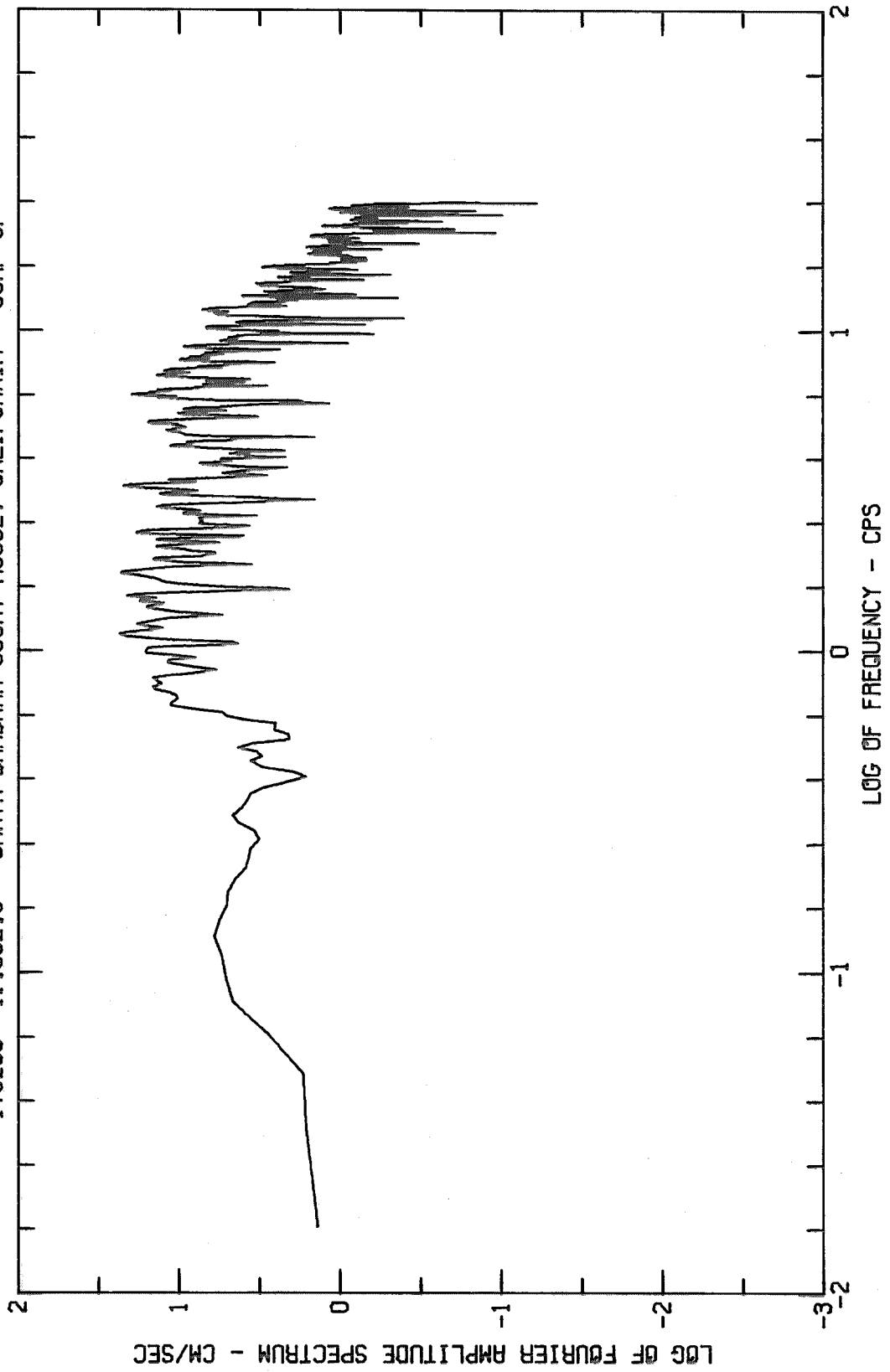
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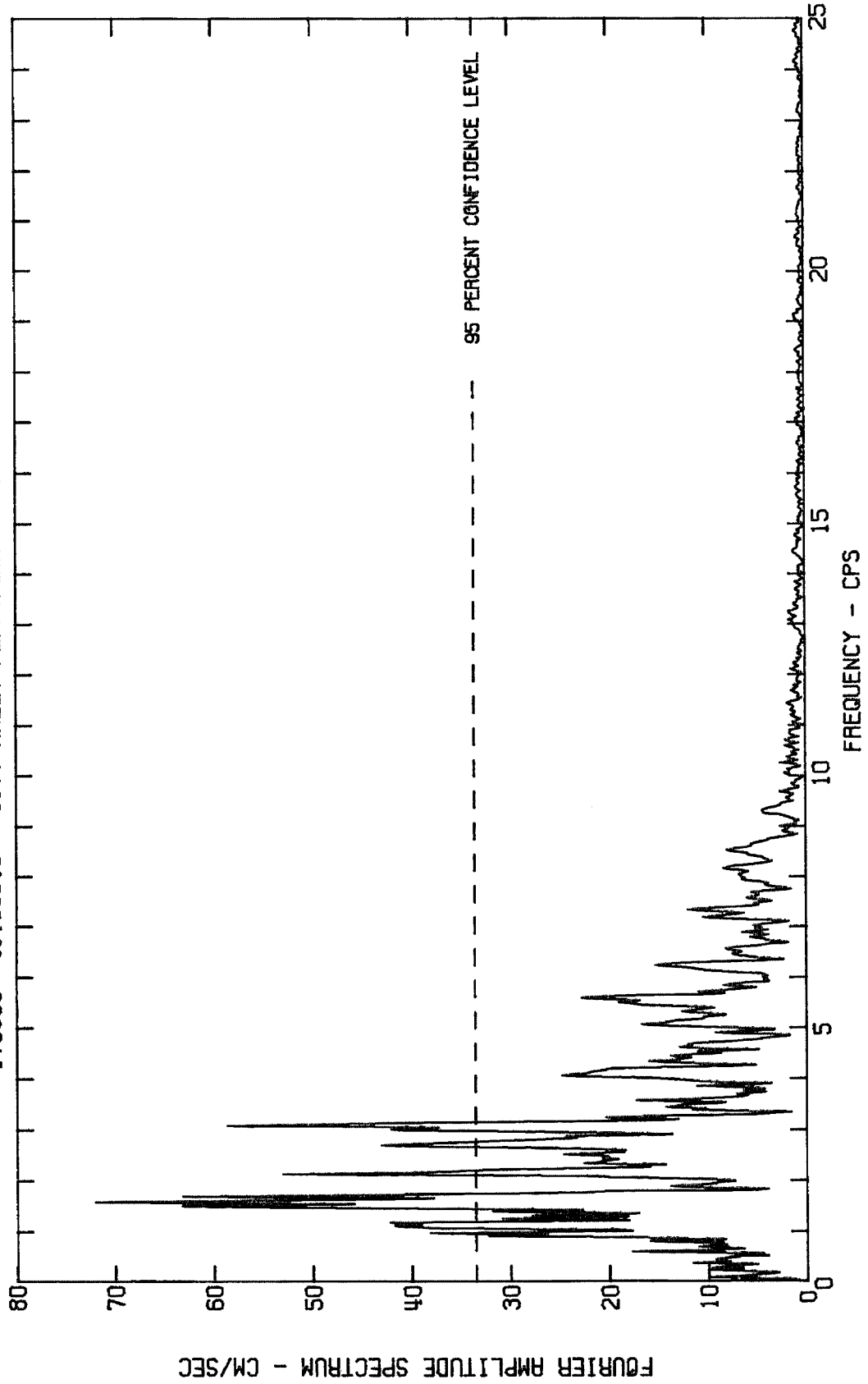
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SANTA BARBARA EARTHQUAKE JUN 30, 1941 - 2351 PST  
IVU299 41.002.0 SANTA BARBARA COURT HOUSE, CALIFORNIA COMP UP



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
SANTA BARBARA EARTHQUAKE JUN 30, 1941 - 2351 PST  
IVU299 41.002.0 SANTA BARBARA COURT HOUSE, CALIFORNIA COMP UP

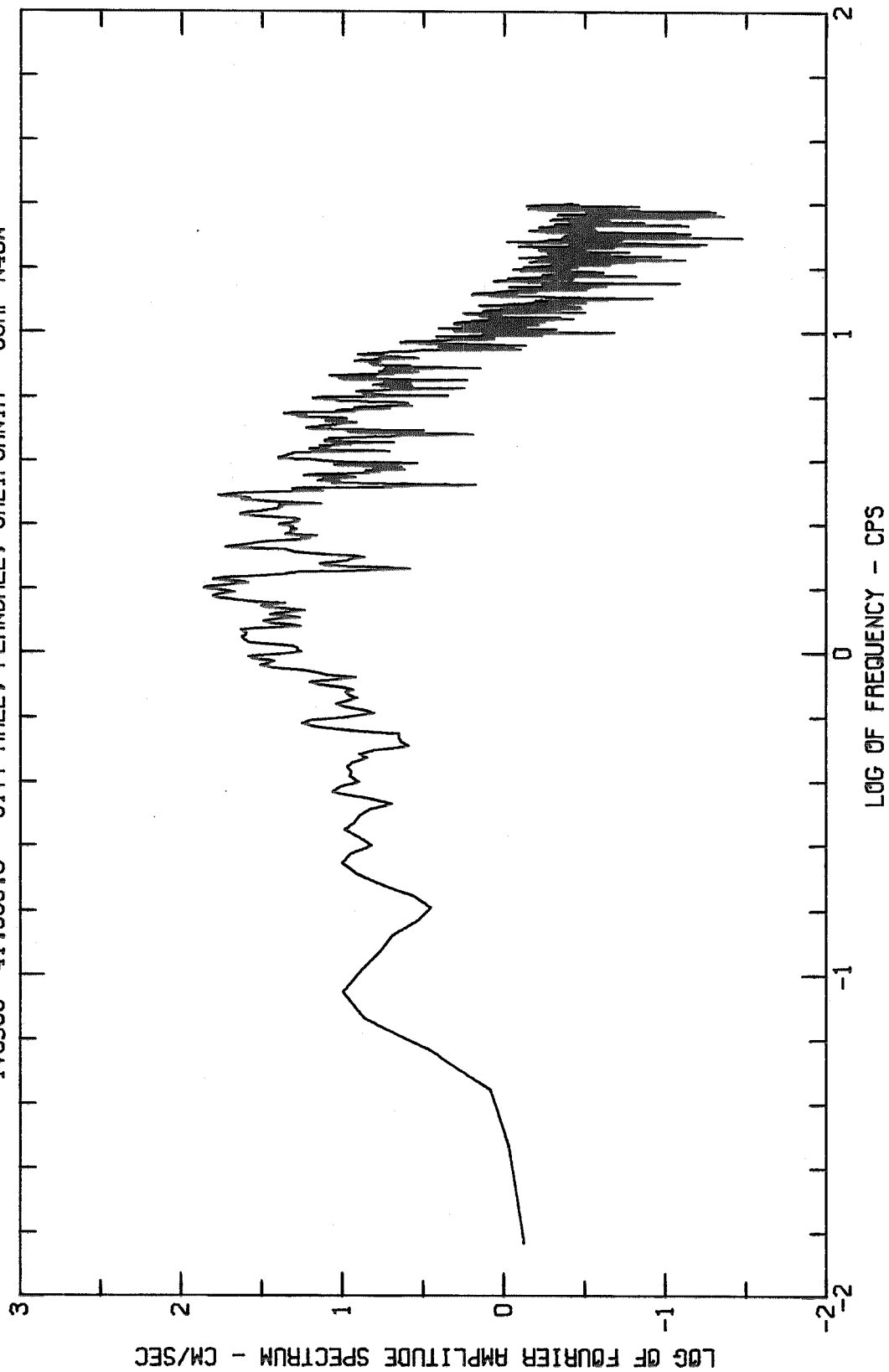


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
NORTHERN CALIFORNIA EARTHQUAKE OCT 3, 1941 - 0814 PST  
IVU300 41.003.0 CITY HALL, FERNDALE, CALIFORNIA COMP N45W

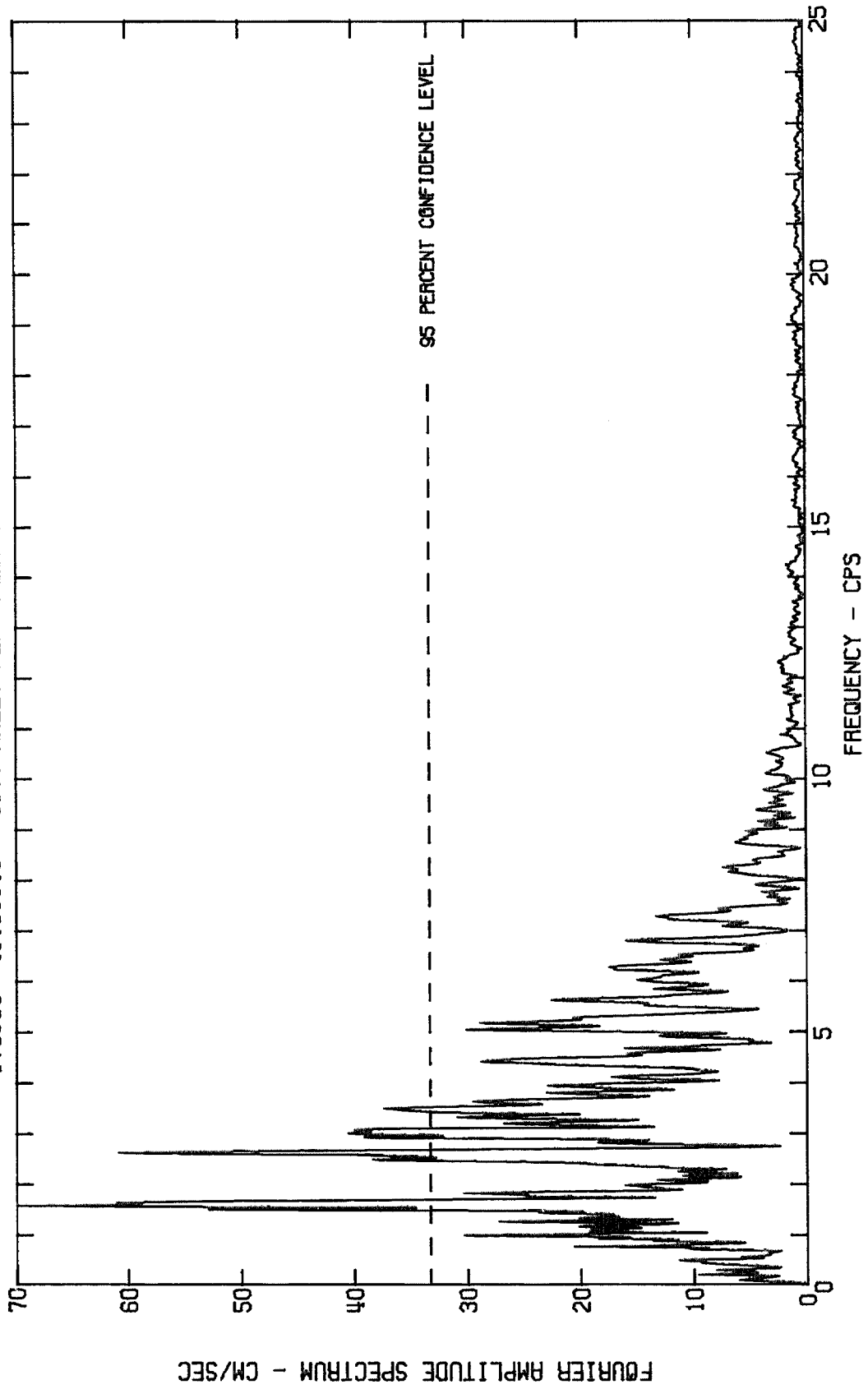




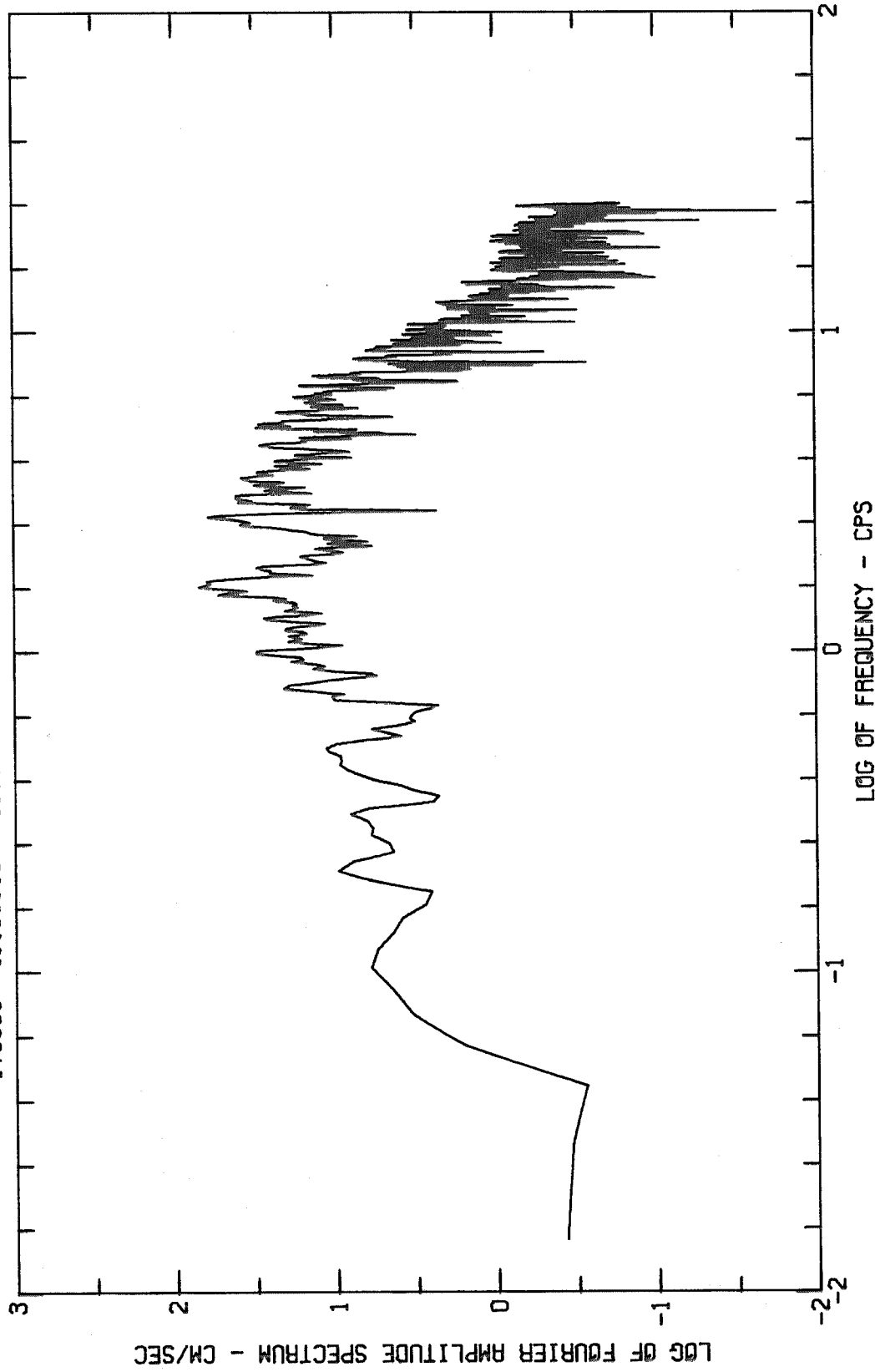
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NORTHERN CALIFORNIA EARTHQUAKE OCT 3, 1941 - 0814 PST  
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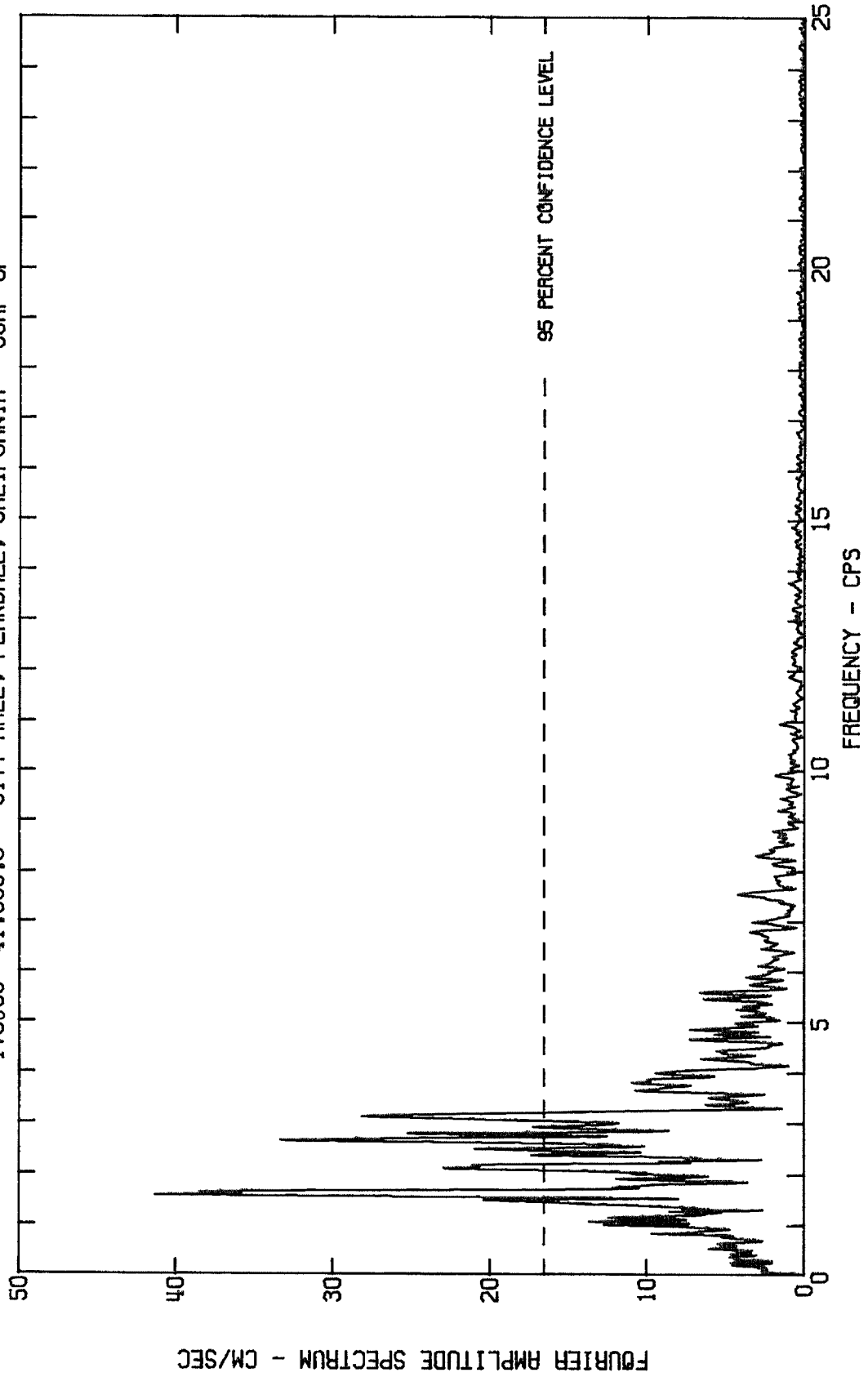
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NORTHERN CALIFORNIA EARTHQUAKE OCT 3, 1941 - 0814 PST  
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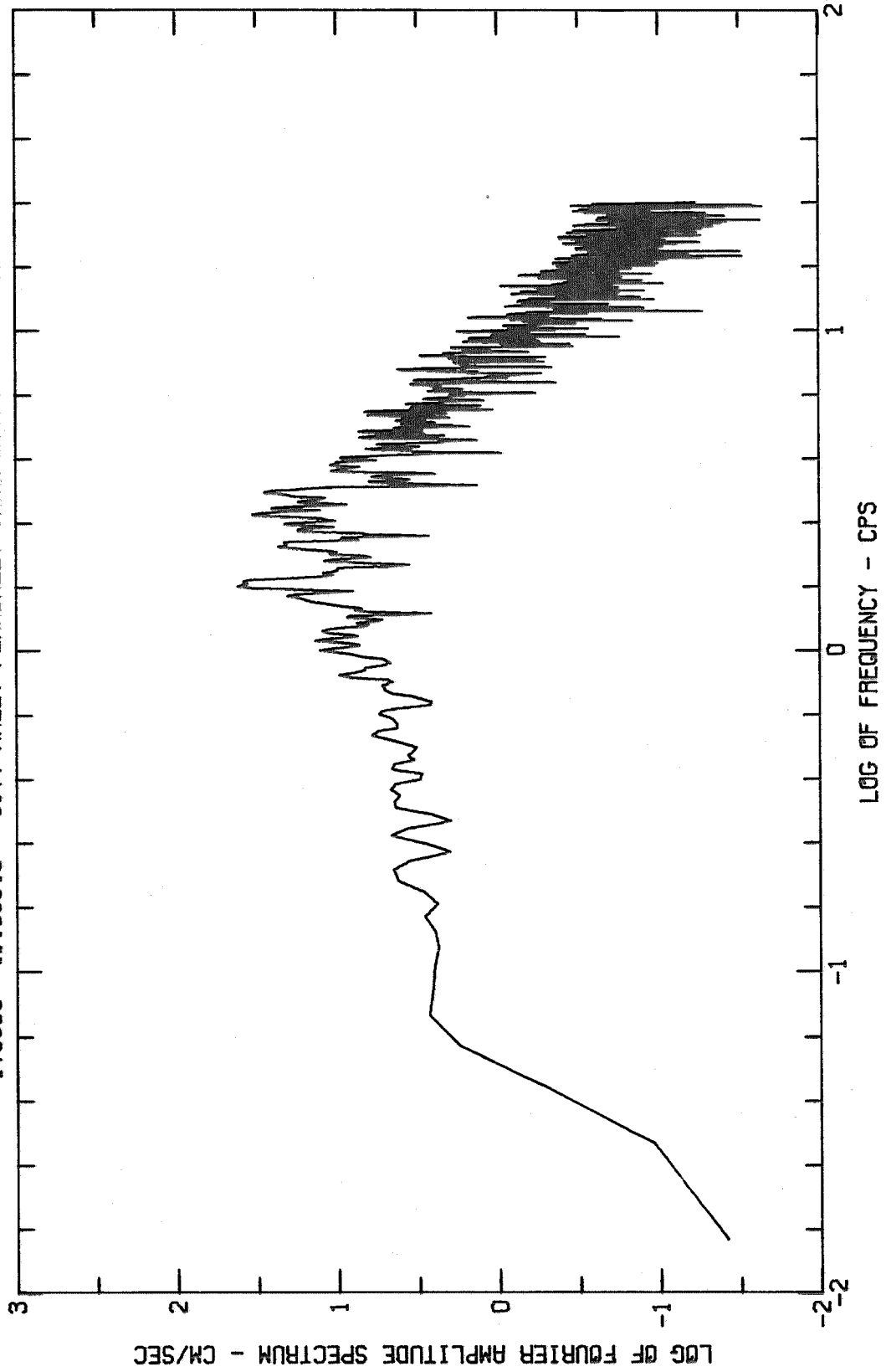
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NORTHERN CALIFORNIA EARTHQUAKE OCT 3, 1941 - 0814 PST  
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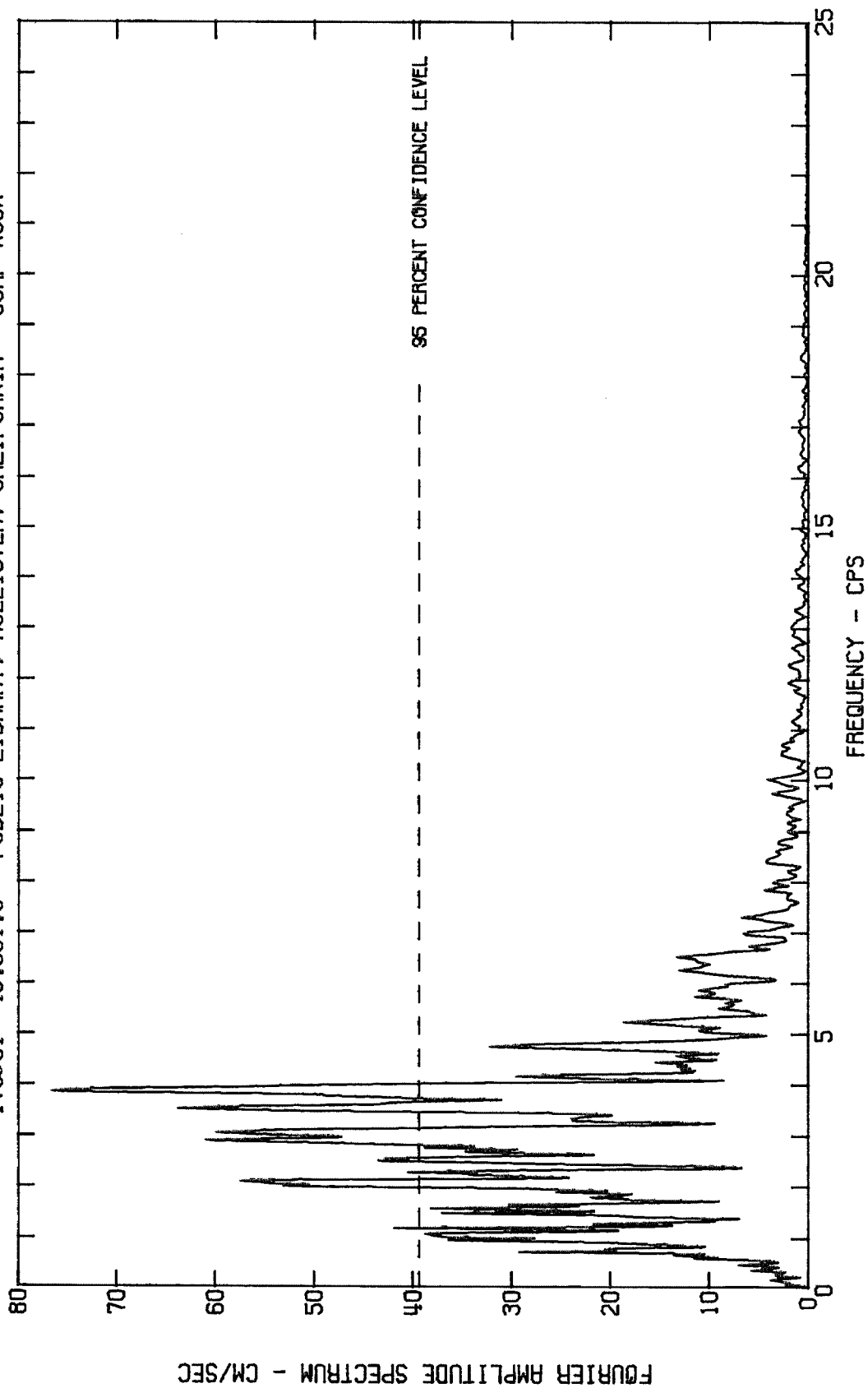
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NORTHERN CALIFORNIA EARTHQUAKE OCT 3, 1941 - 0814 PST  
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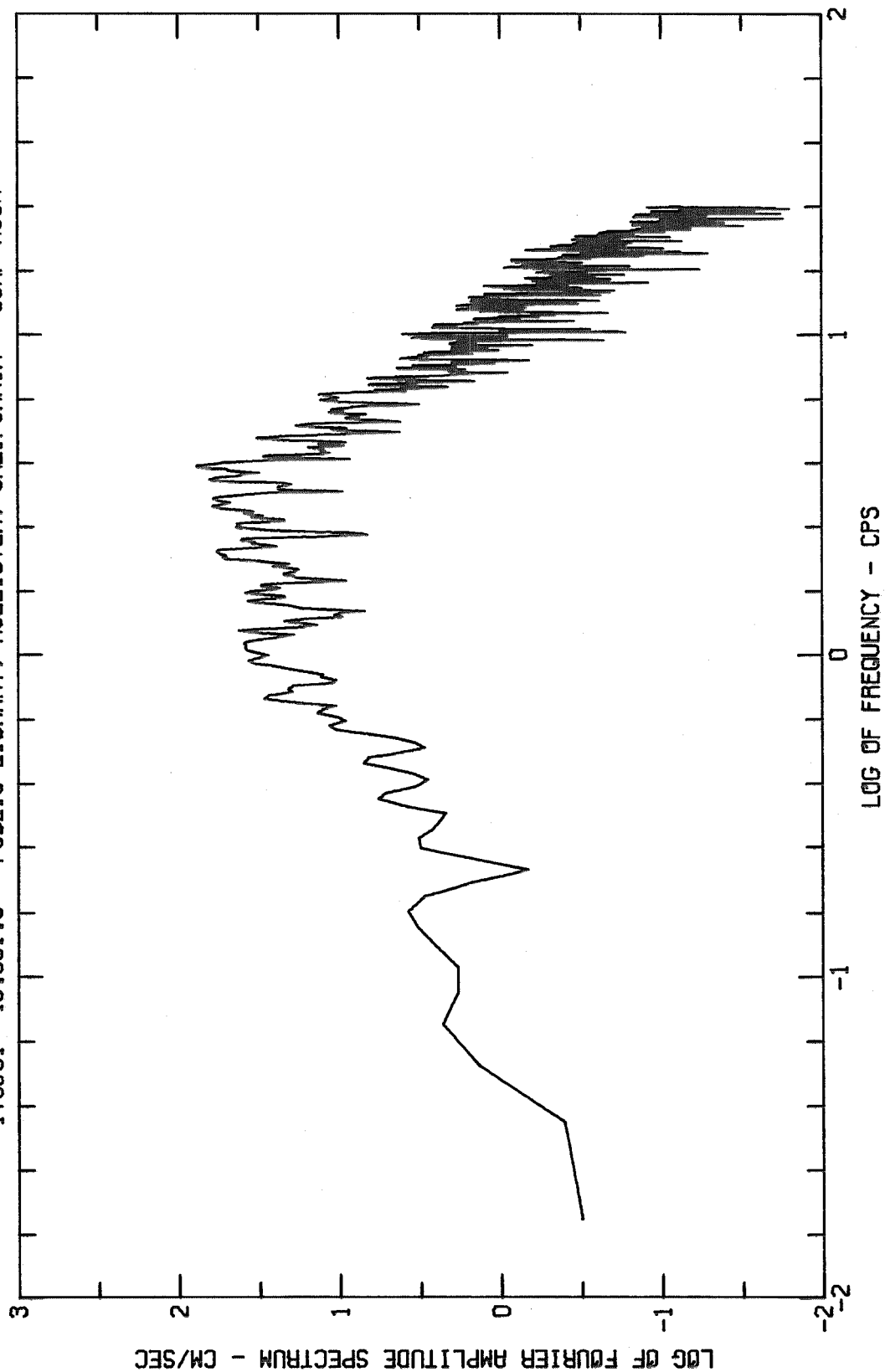
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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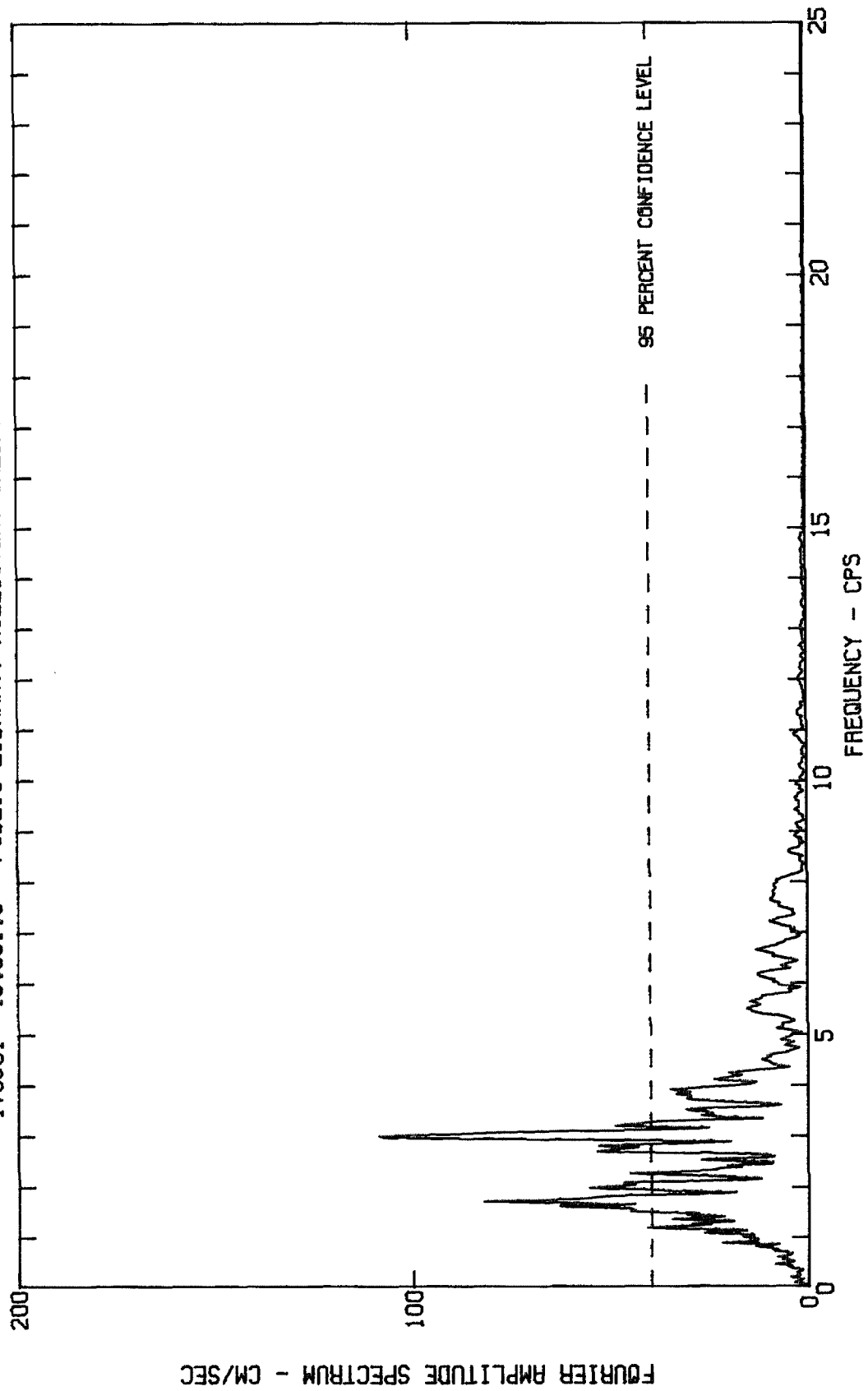
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
NORTHERN CALIFORNIA EARTHQUAKE MAR 9, 1949 - 0429 PST  
1VU301 49.001.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP N89W



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
NORTHERN CALIFORNIA EARTHQUAKE MAR 9, 1949 - 0429 PST  
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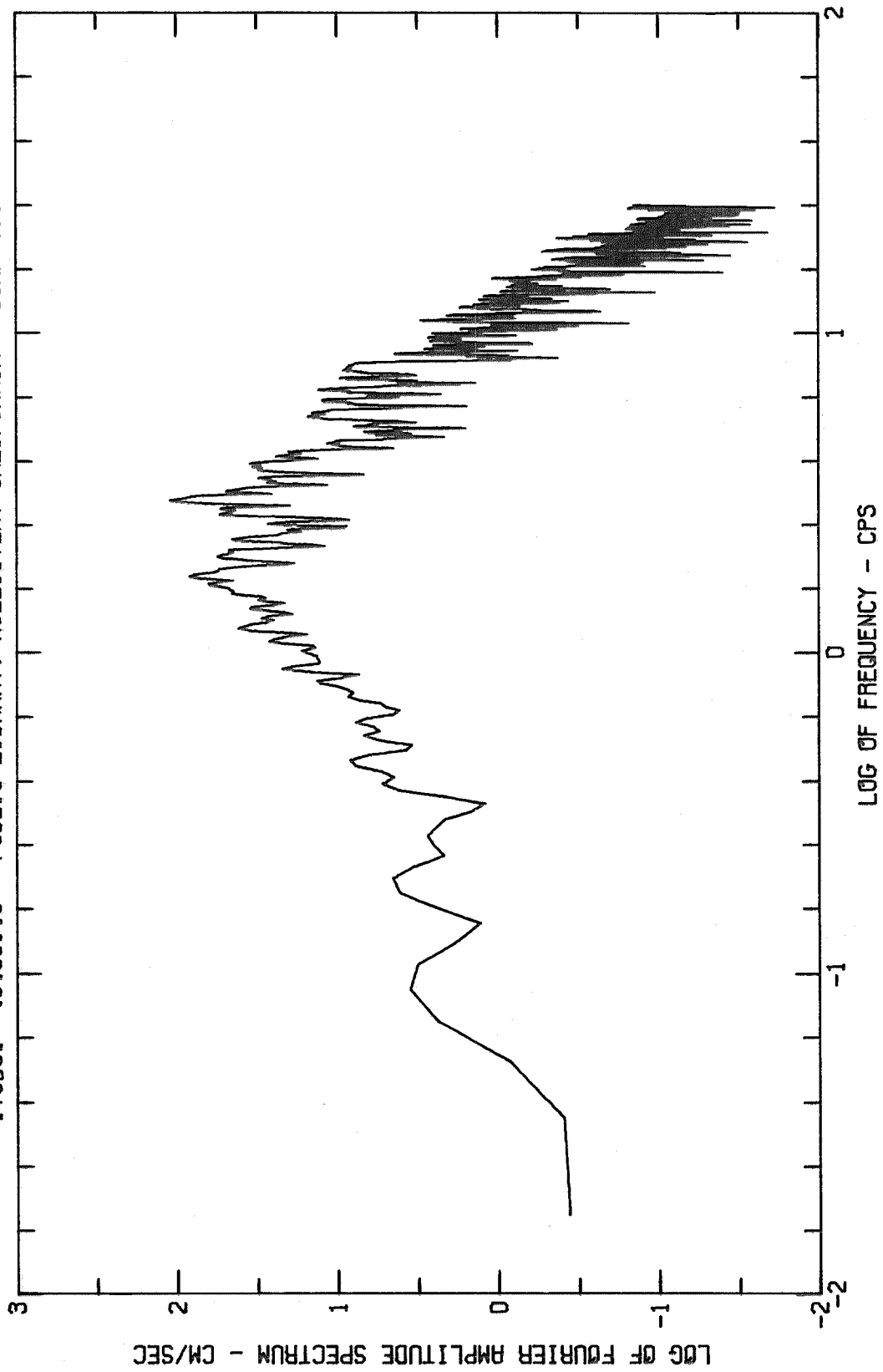


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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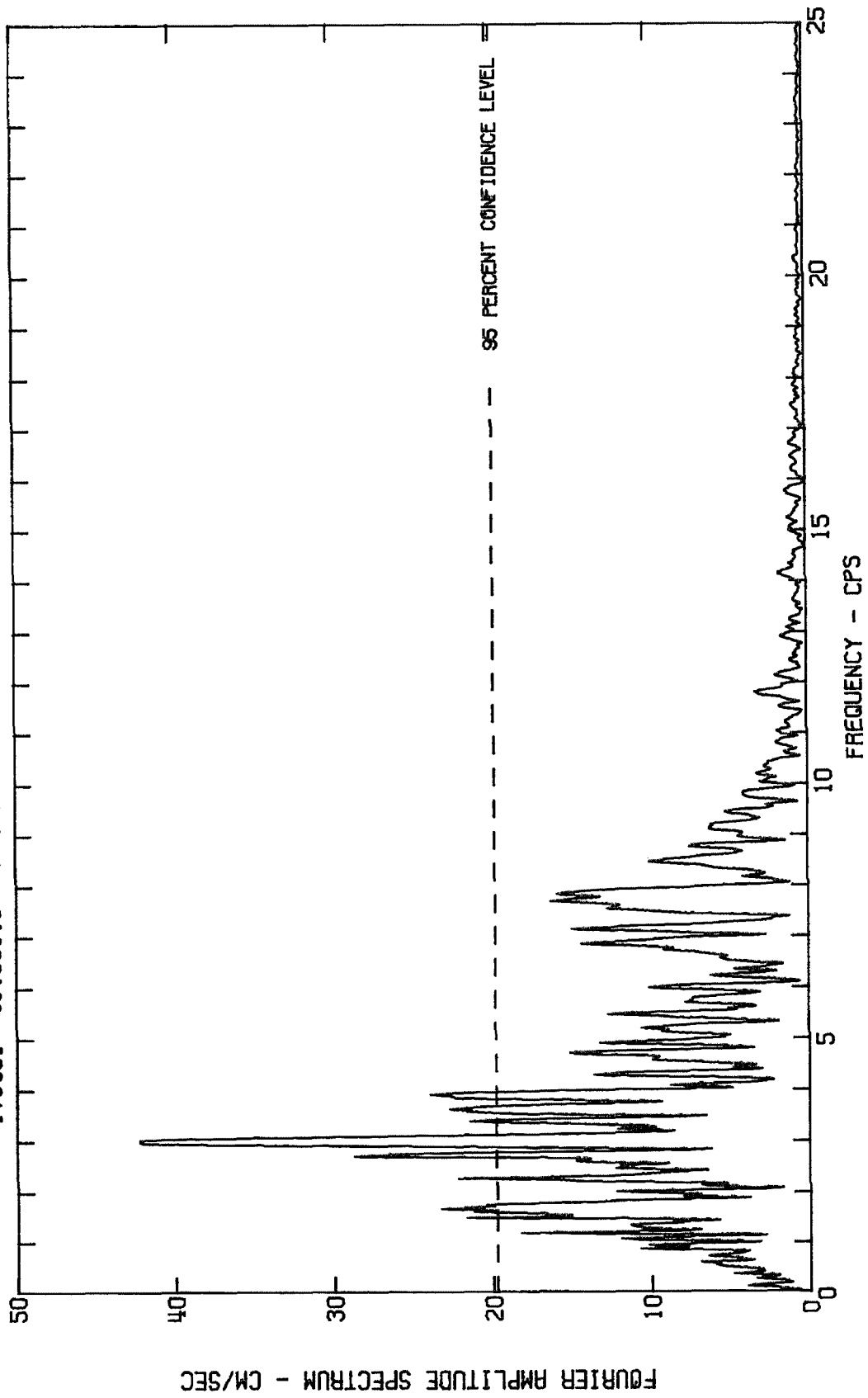




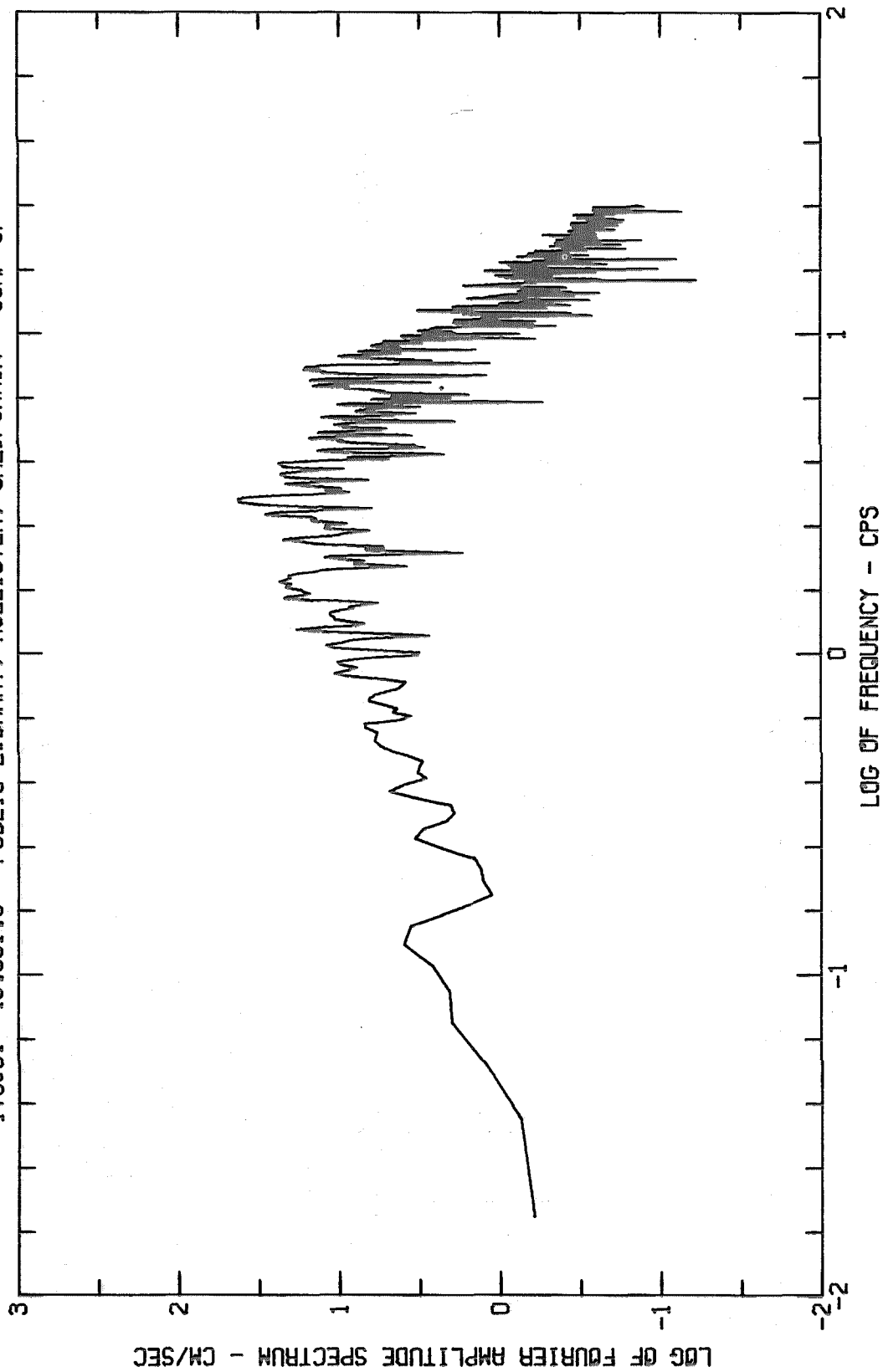
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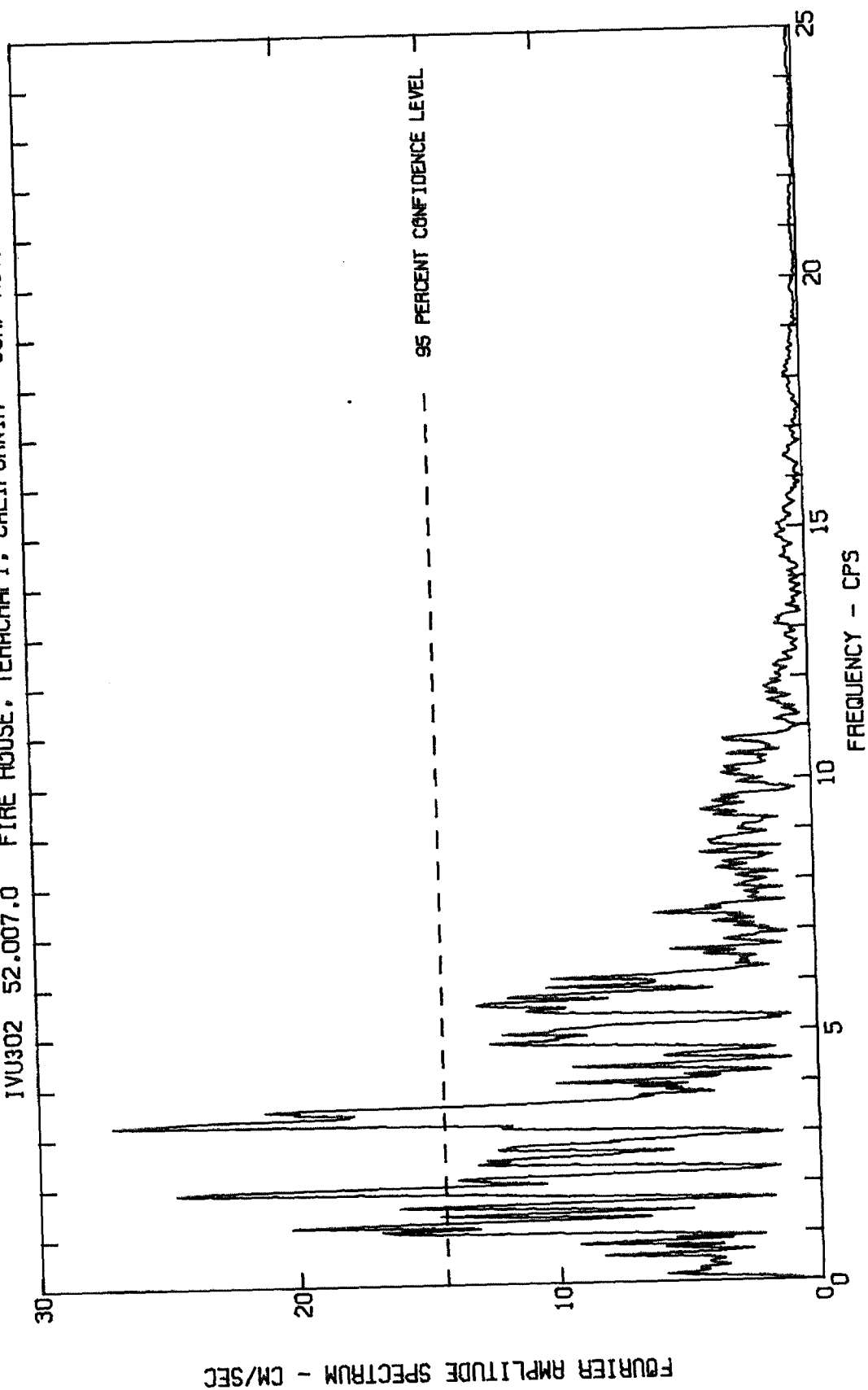
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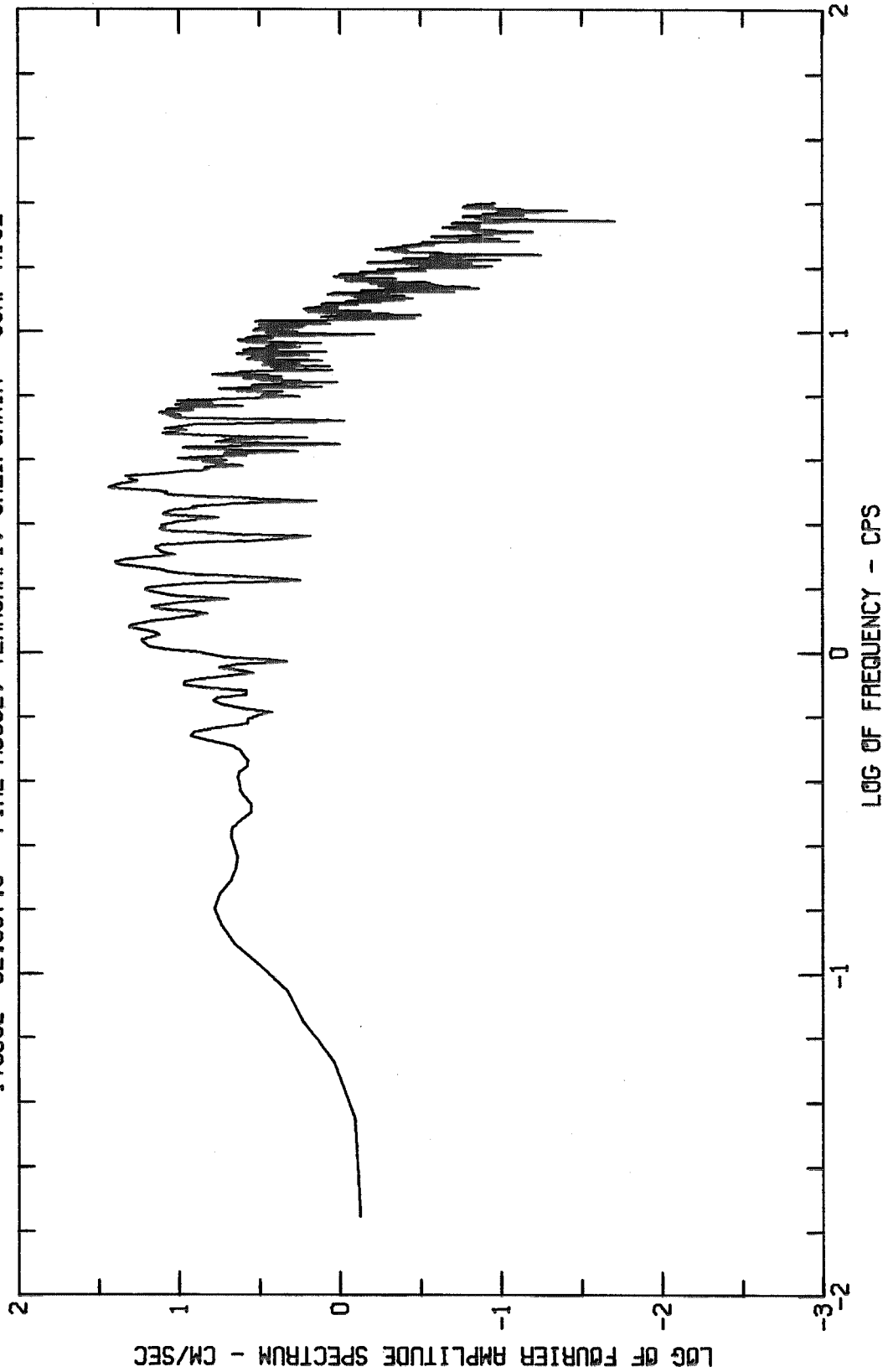
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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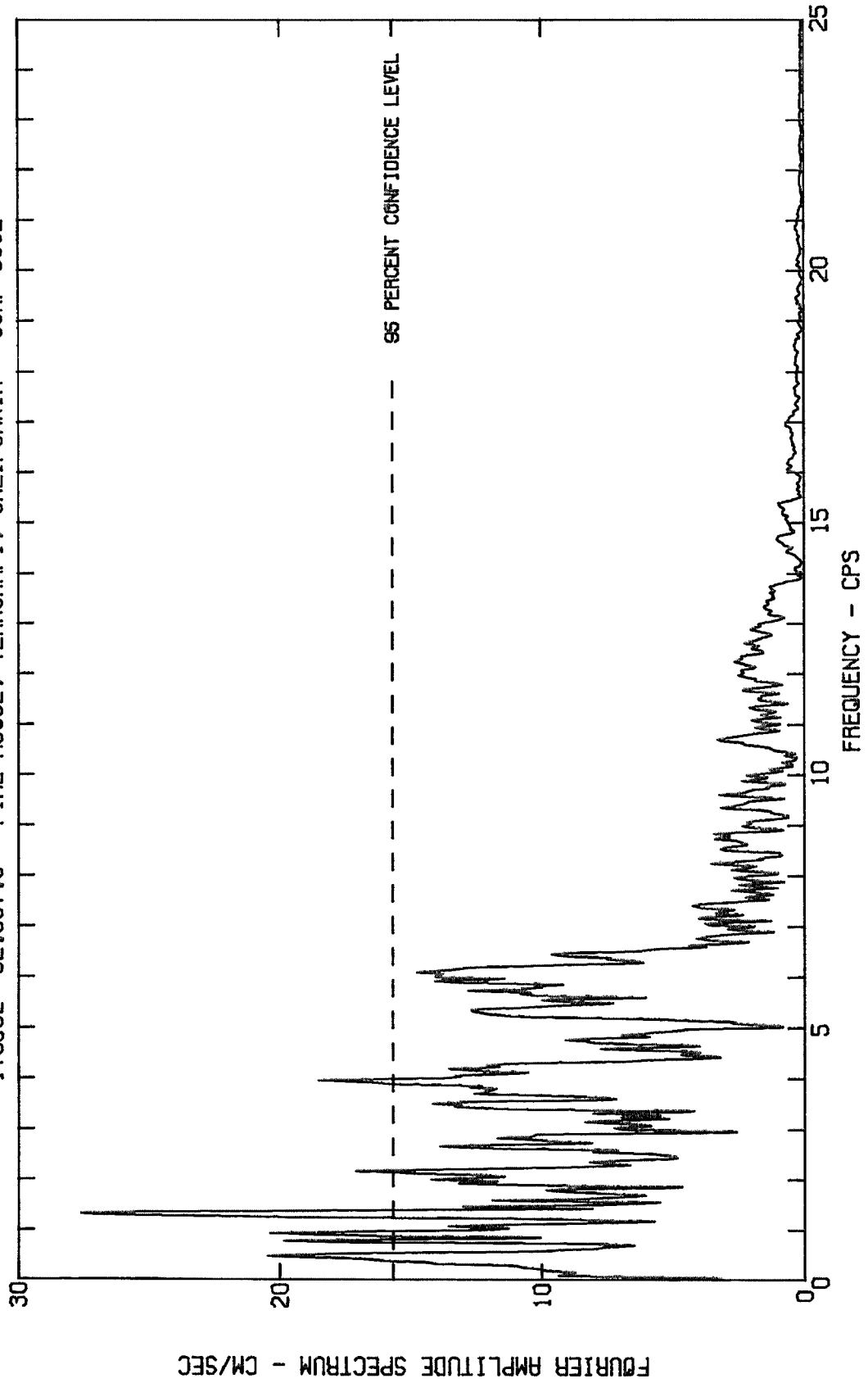
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 1ST AFTERSHOCK JUL 23-31.52 - 0000 PST  
IVU302 52.007.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP N10E



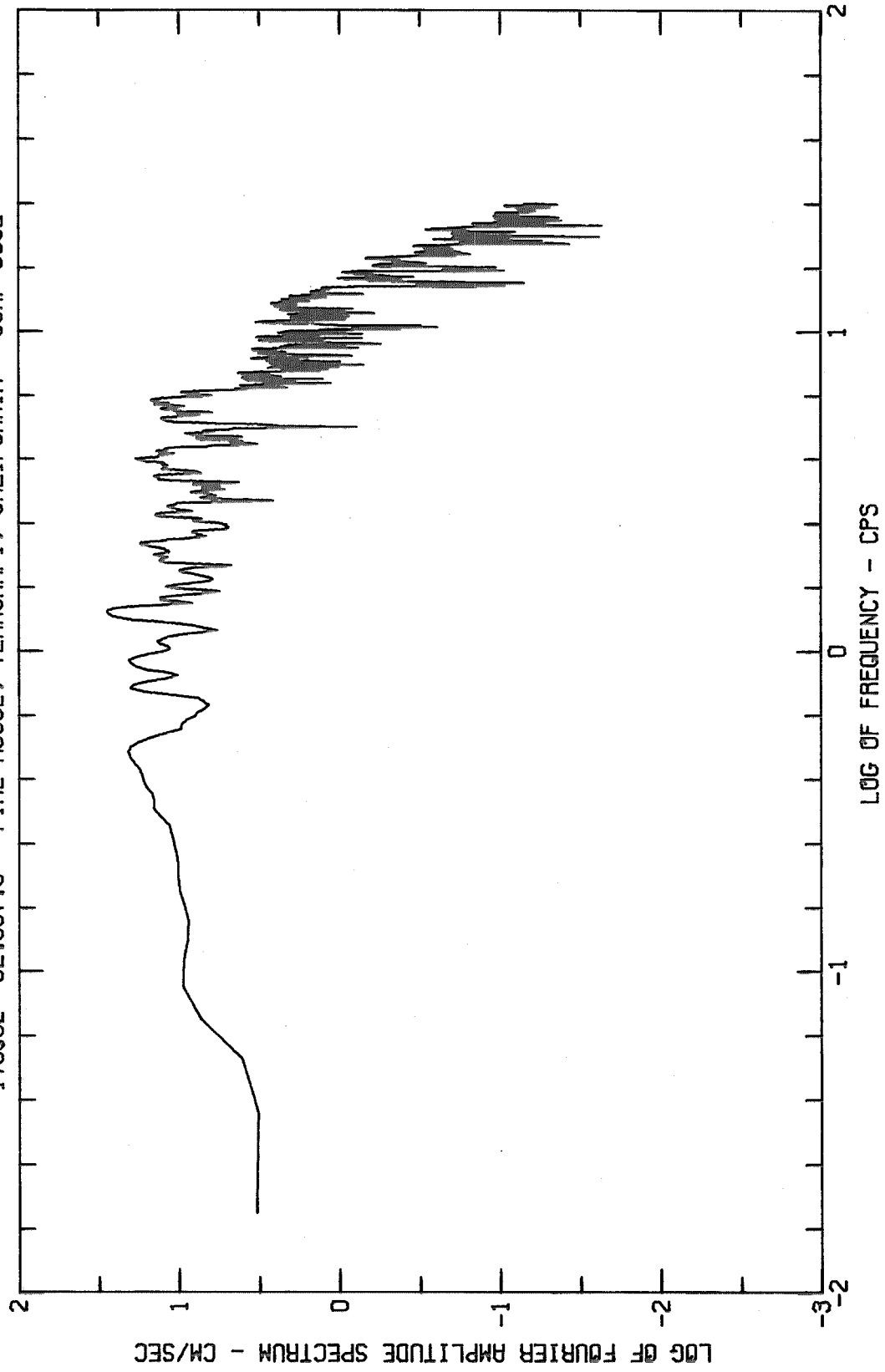
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 1ST AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU302 52.007.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP N10E



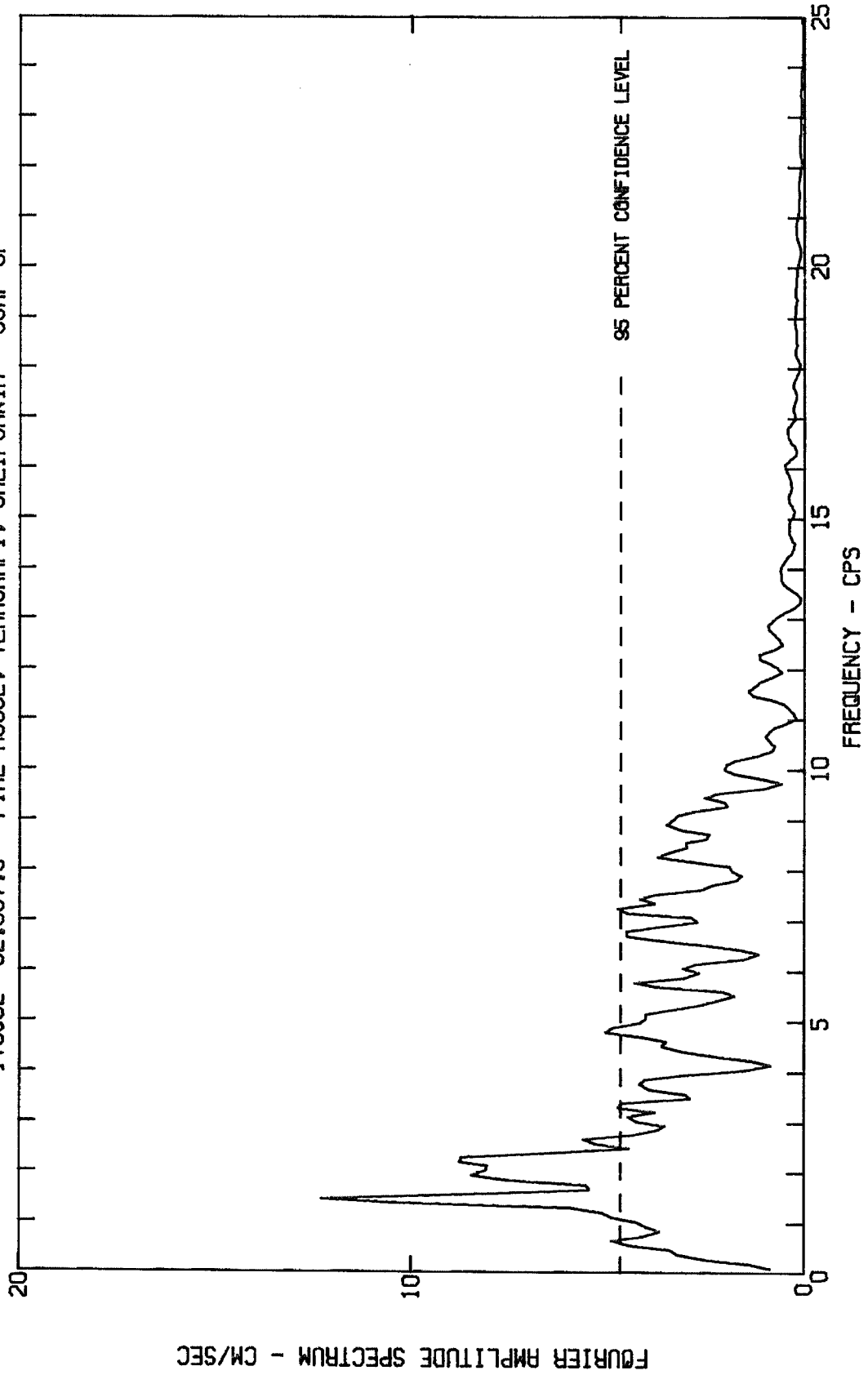
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 1ST AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU302 52.007.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP S80E



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 1ST AFTERSHOCK JUL 23-31,52 - 0000 PST  
1VU302 52.007.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP S80E

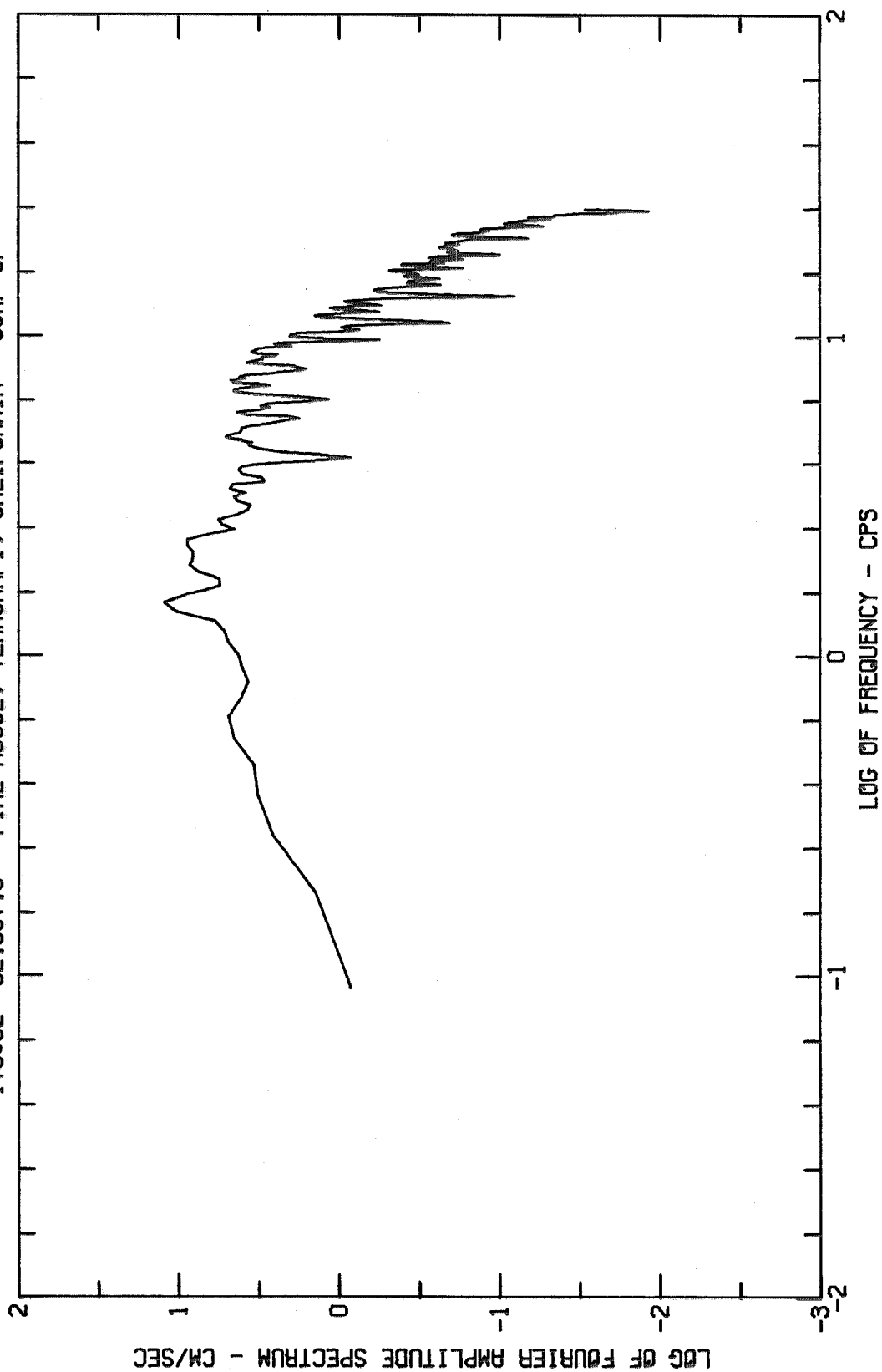


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 1ST AFTERSHOCK JUL 23-31.52 - 0000 PST  
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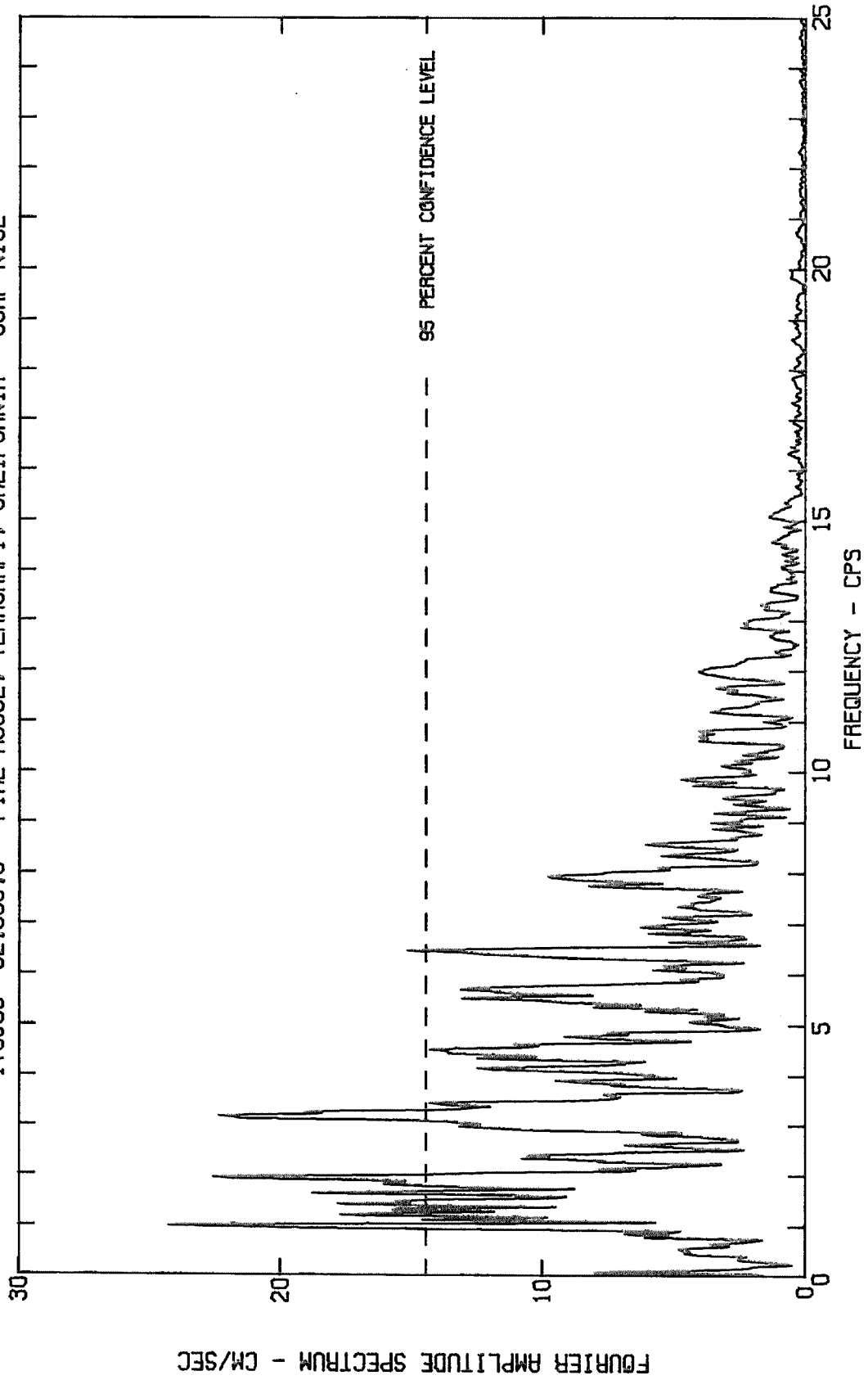




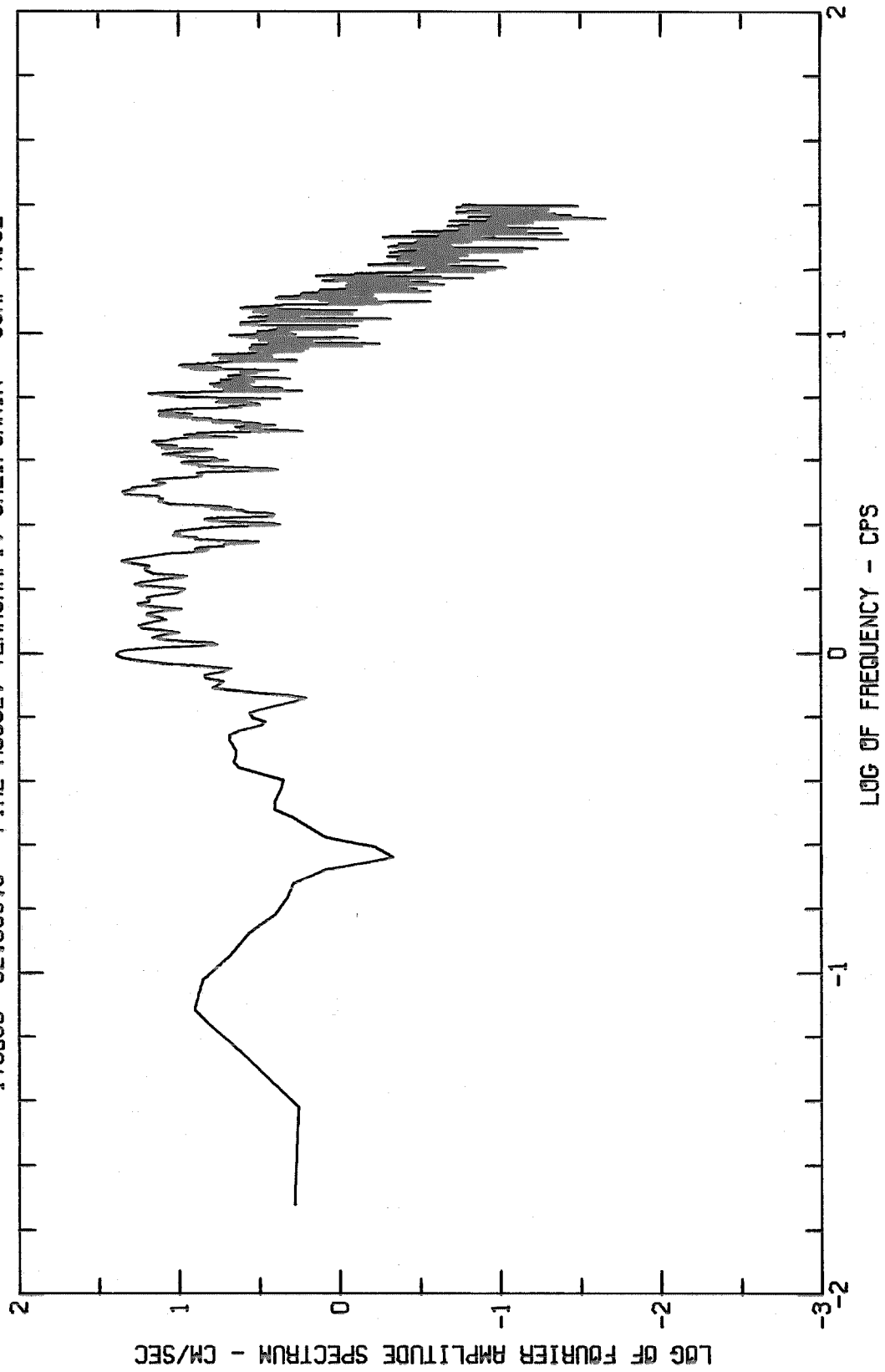
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 1ST AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU302 52.007.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP UP



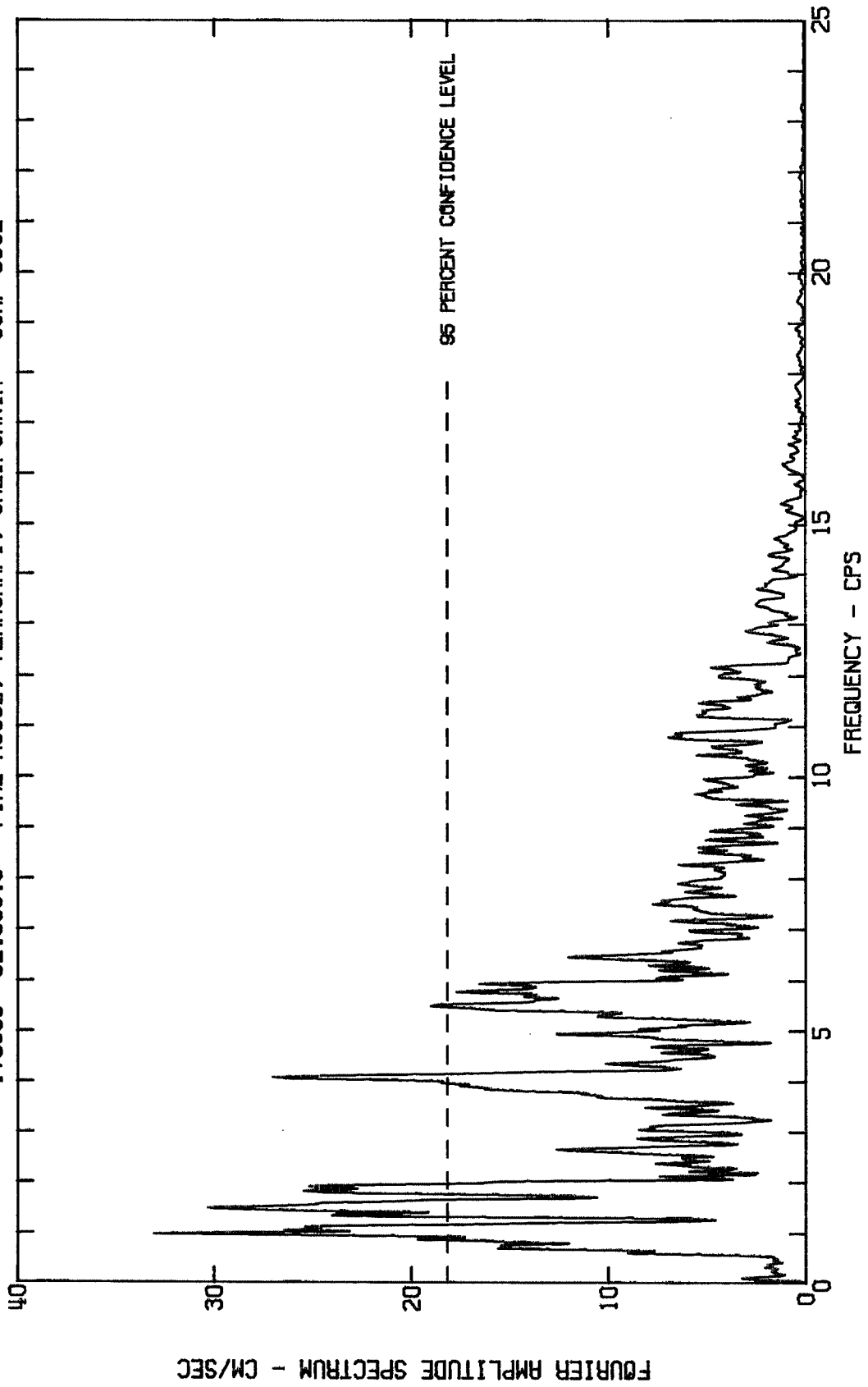
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KERN COUNTY EQ. 2ND AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU303 52.008.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP N10E



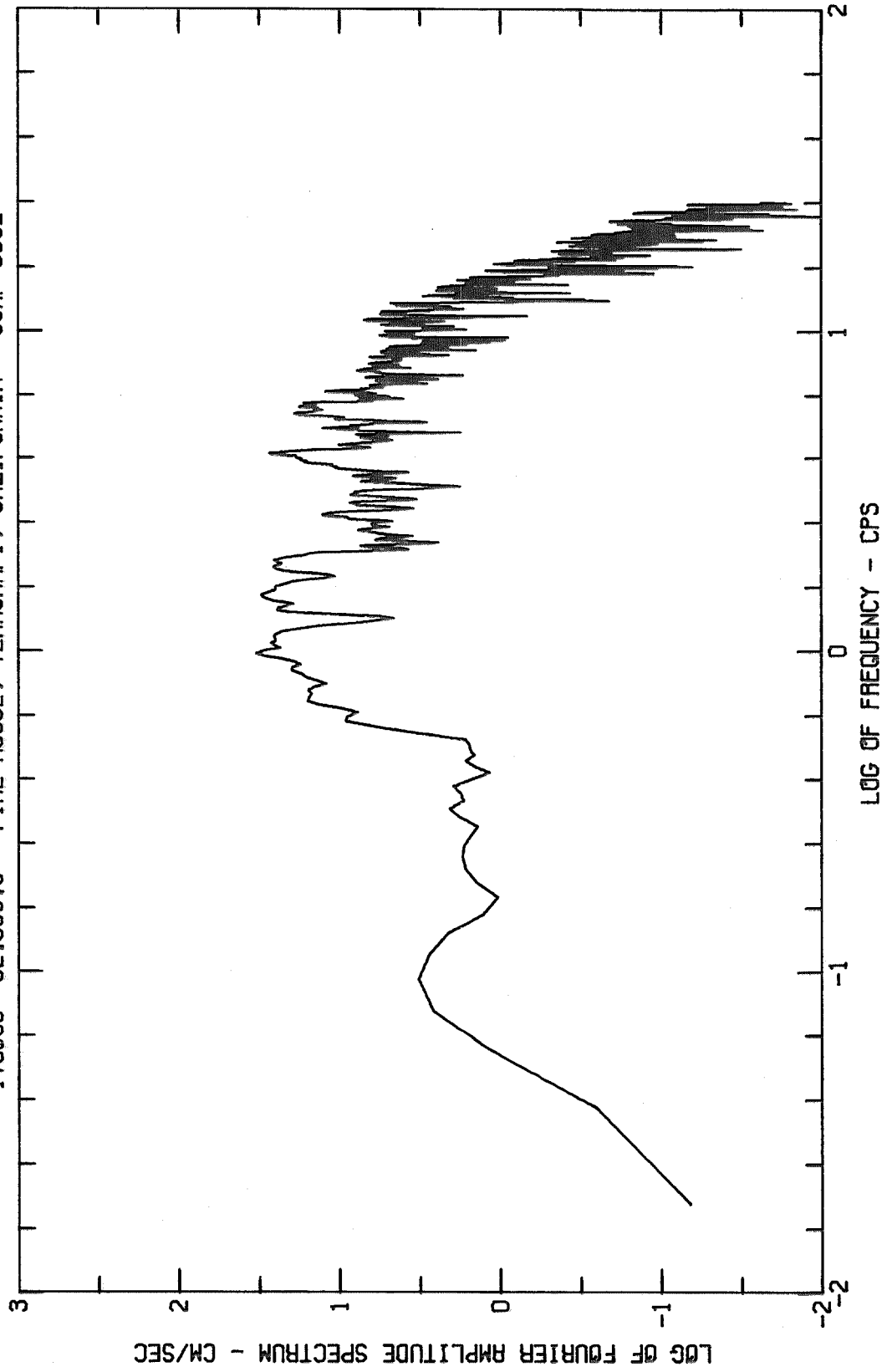
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KERN COUNTY EQ. 2ND AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU303 52.008.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP N10E



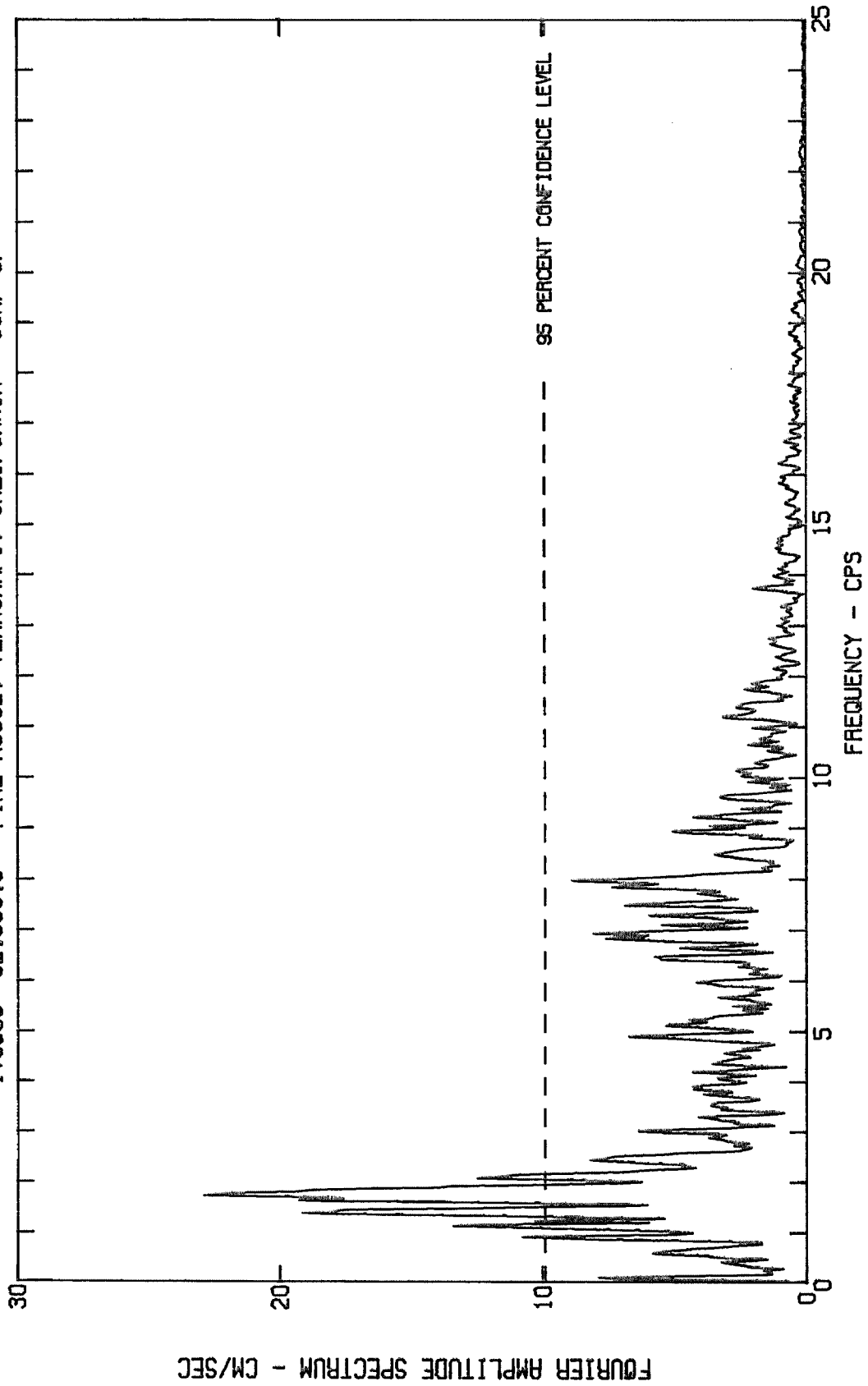
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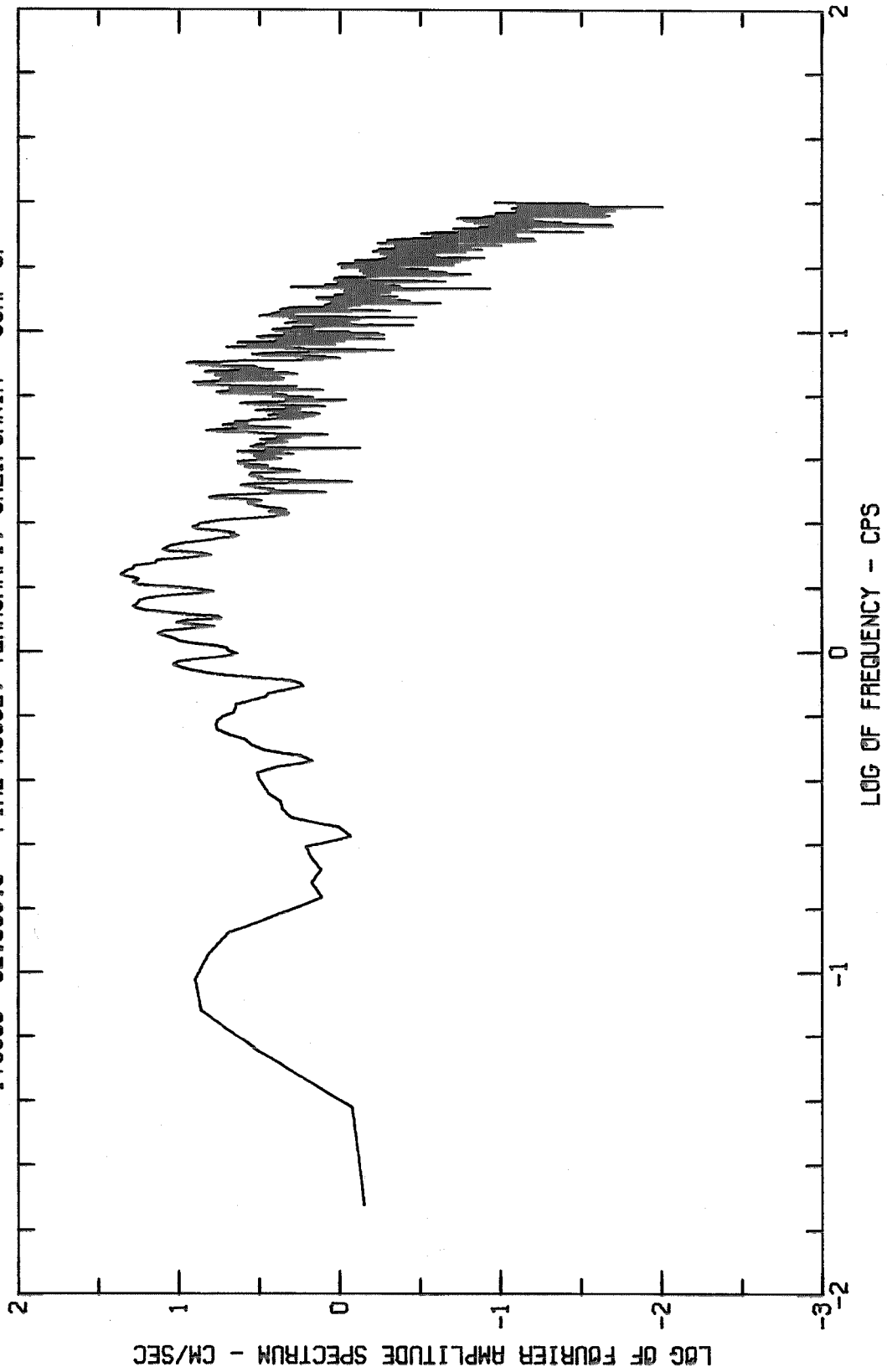
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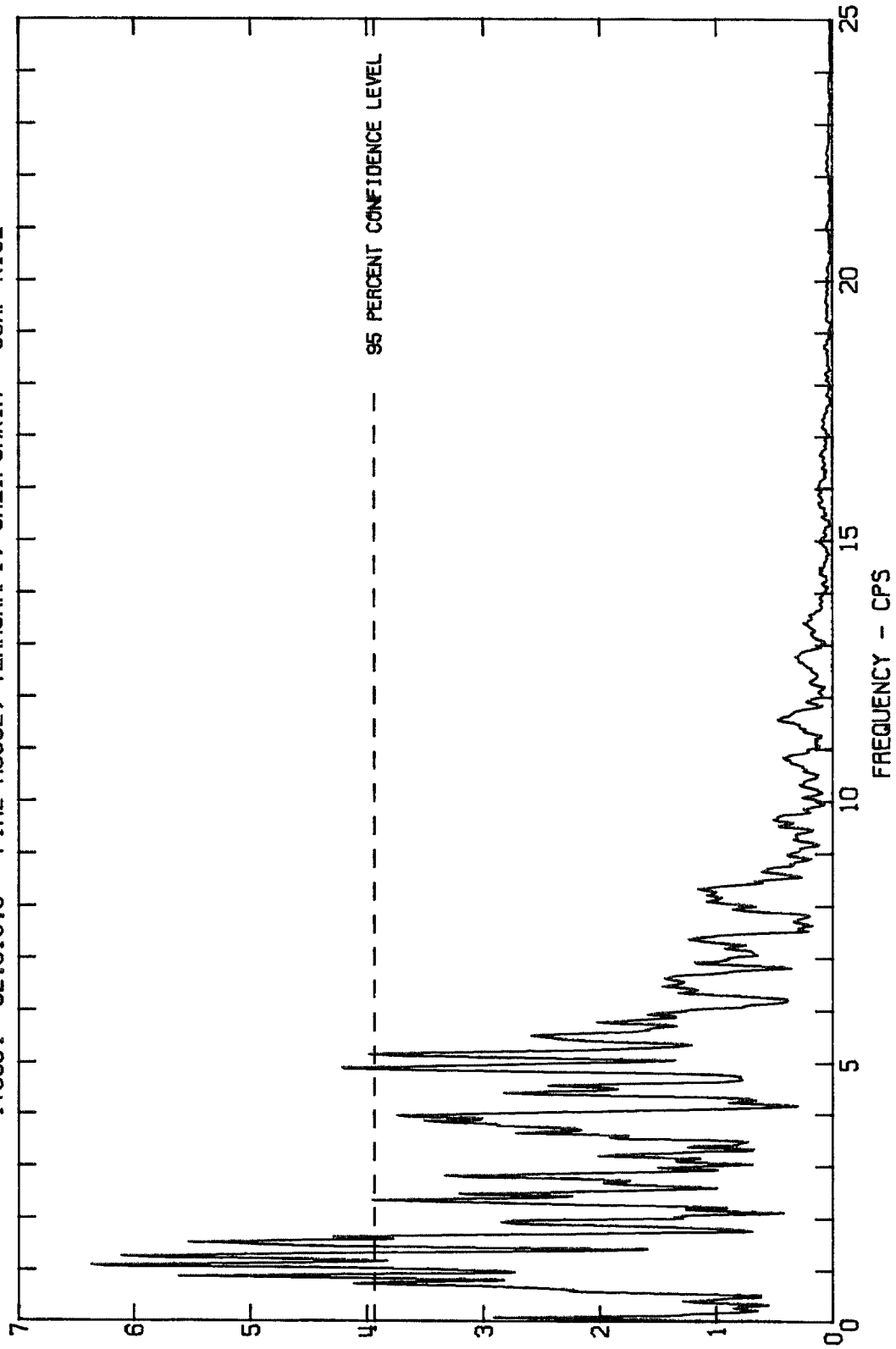
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KERN COUNTY EQ. 2ND AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU303 52.008.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP UP



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
KERN COUNTY EQ. 2ND AFTERSHOCK JUL 23-31.52 - 0000 PST  
1VU303 52.008.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP UP



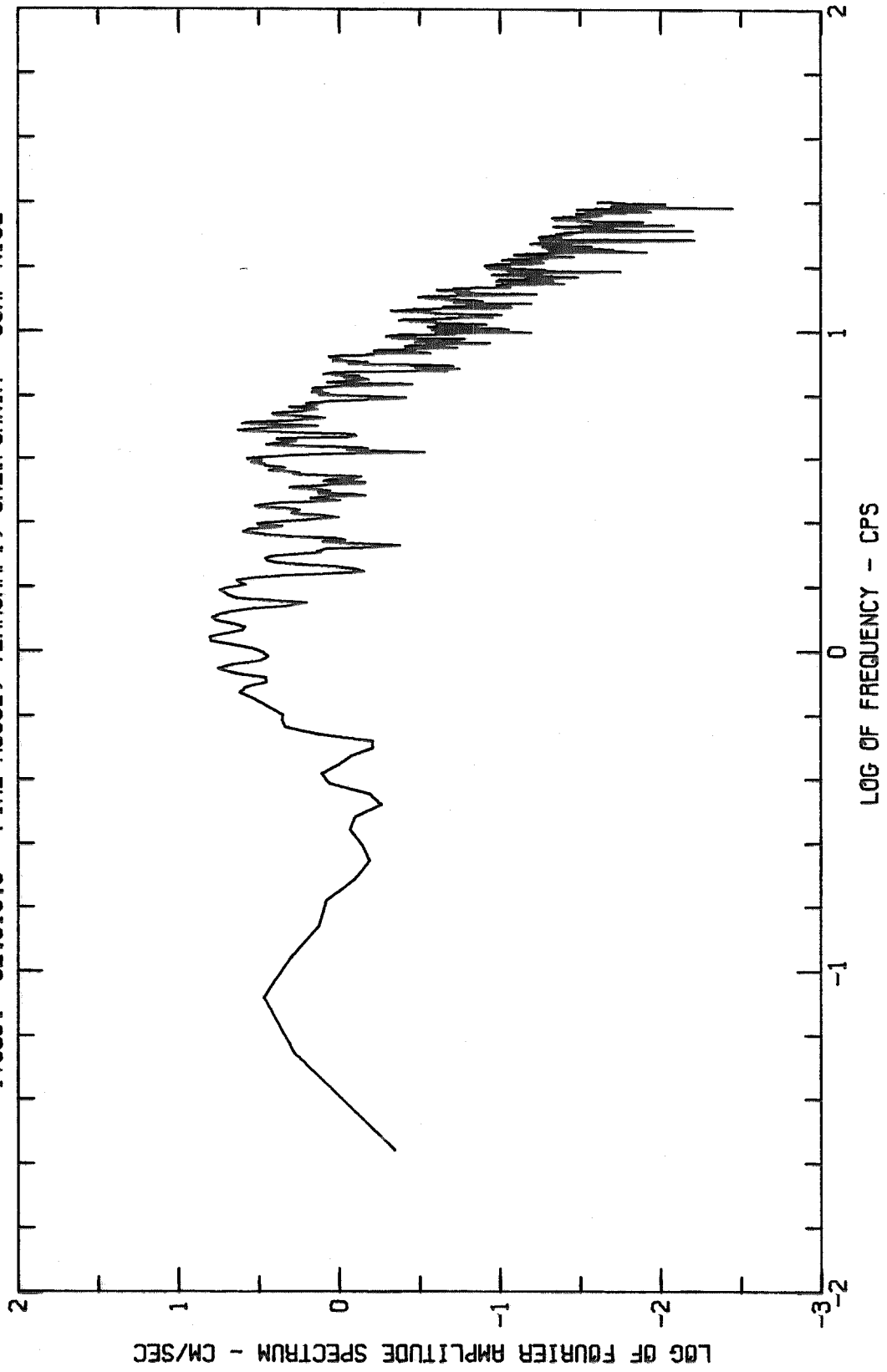
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IVU304 52.010.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP N10E



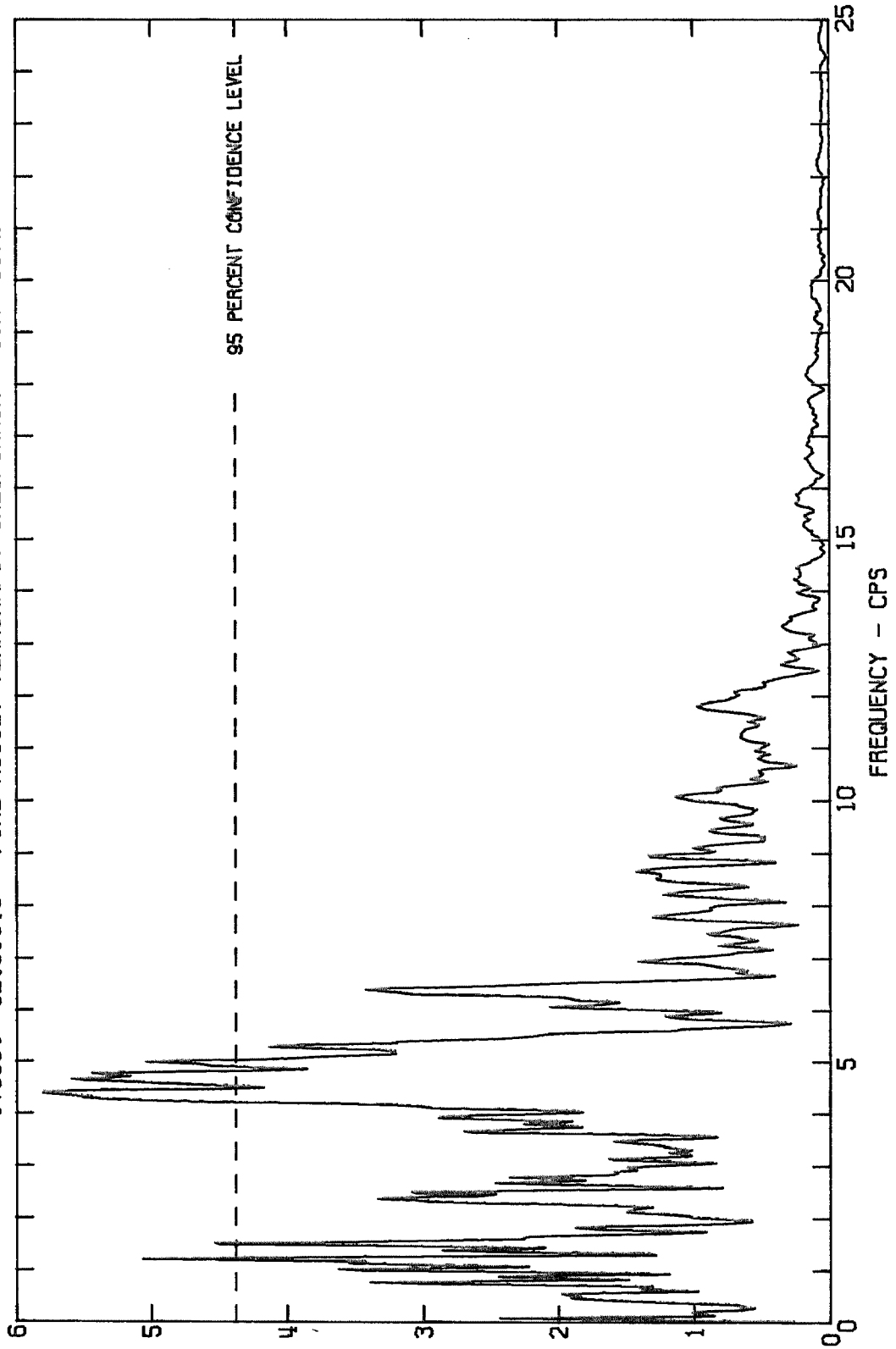
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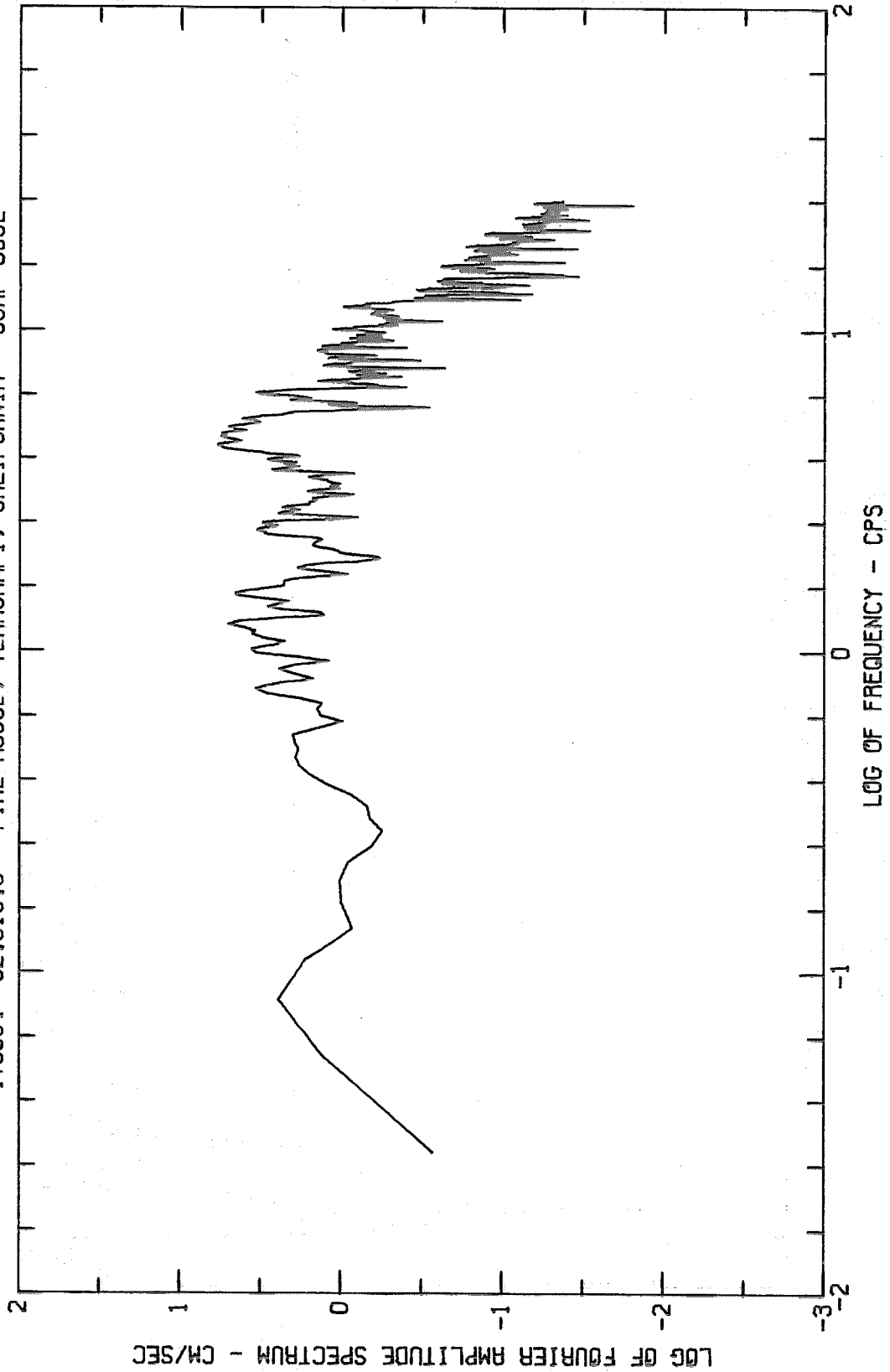
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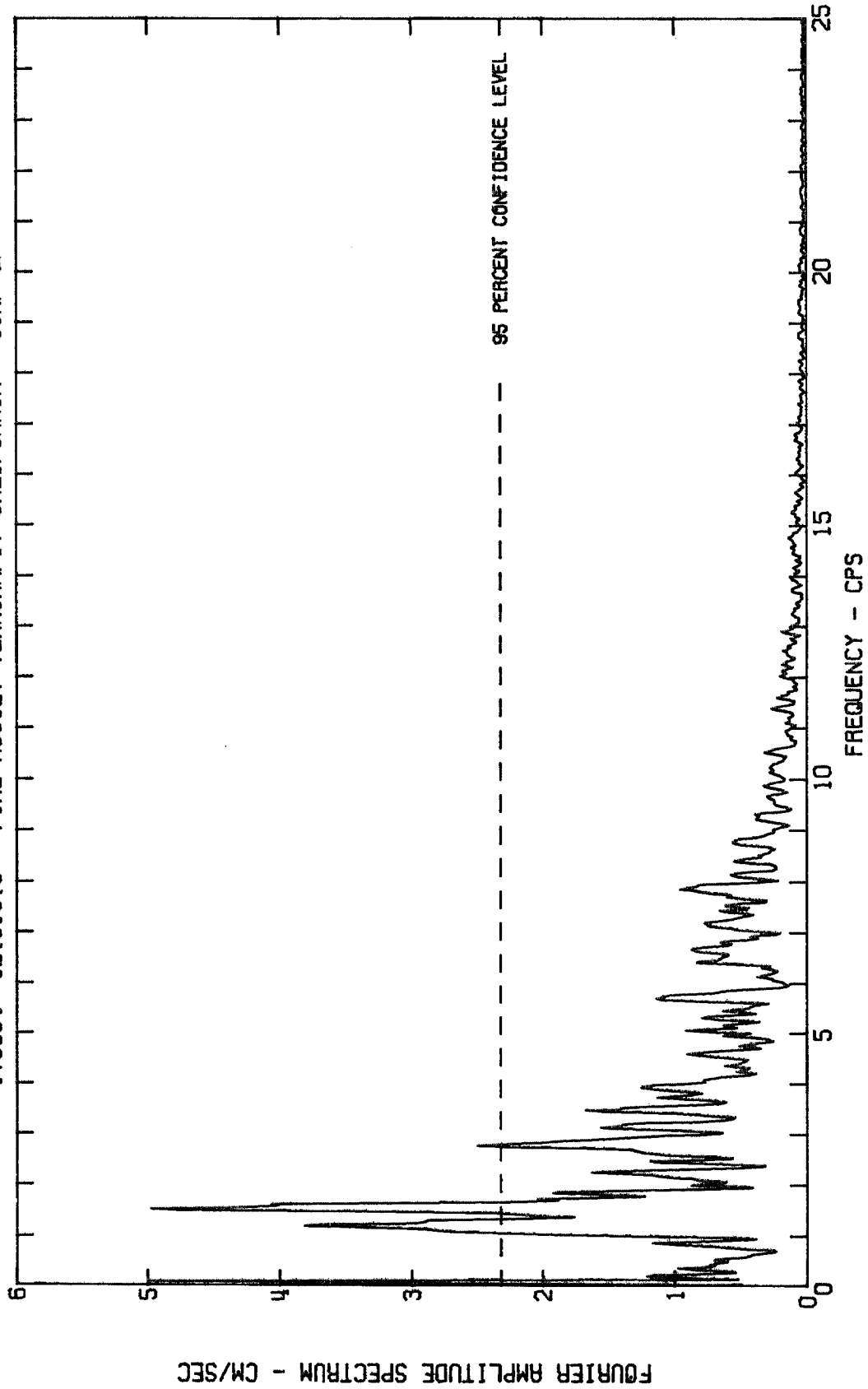
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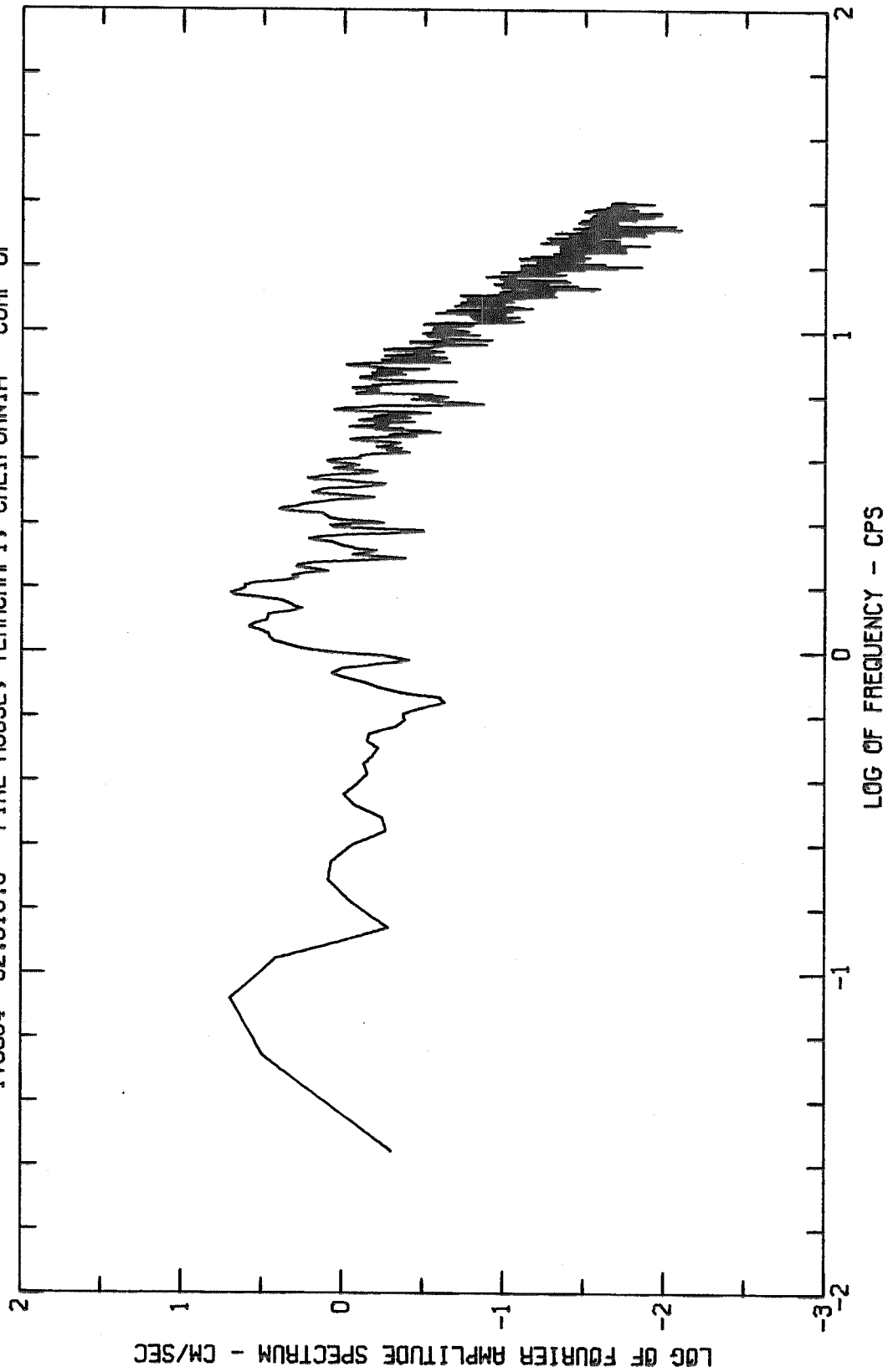
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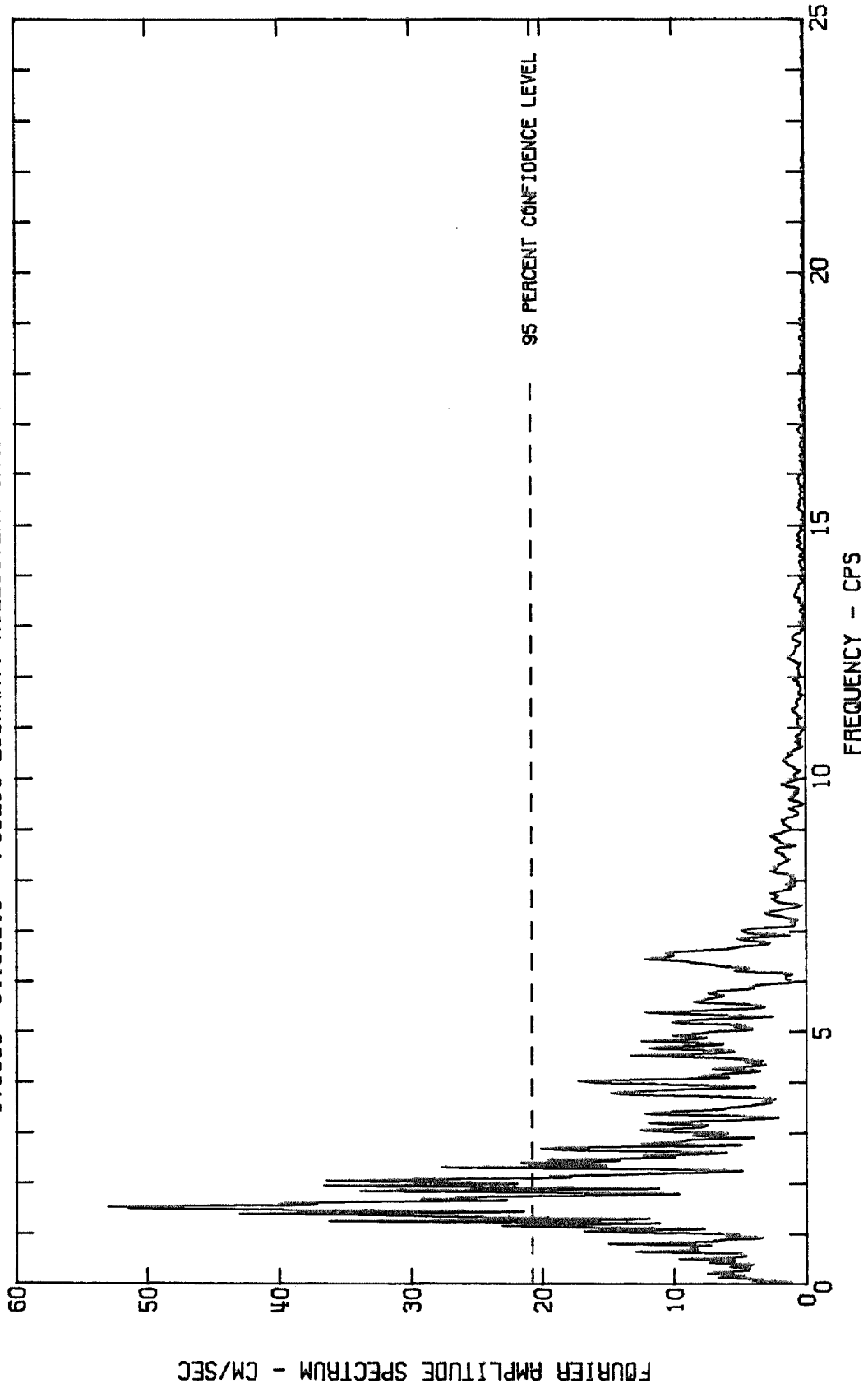
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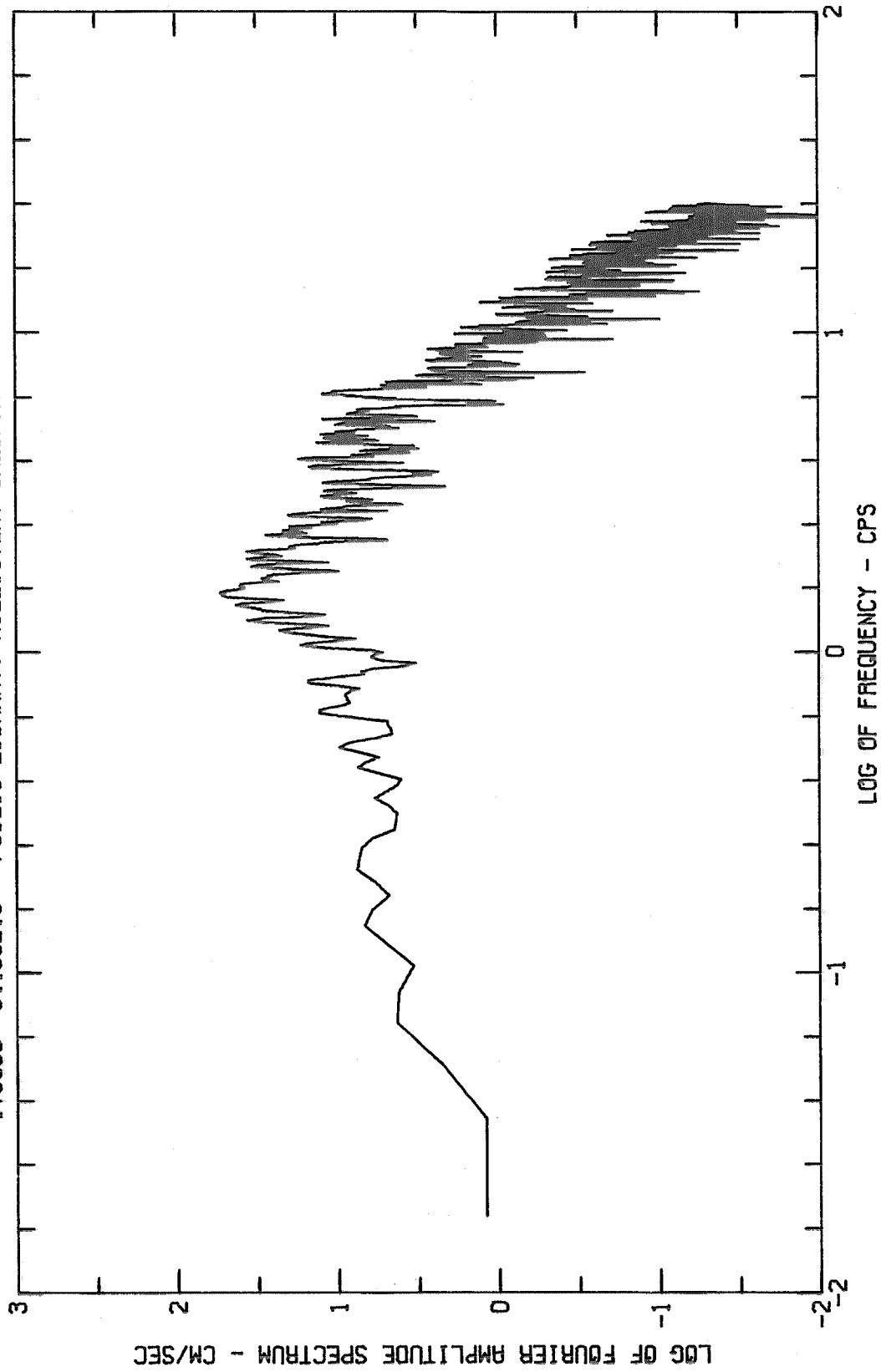
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IVU304 52.010.0 FIRE HOUSE, TEHACHAPI, CALIFORNIA COMP UP



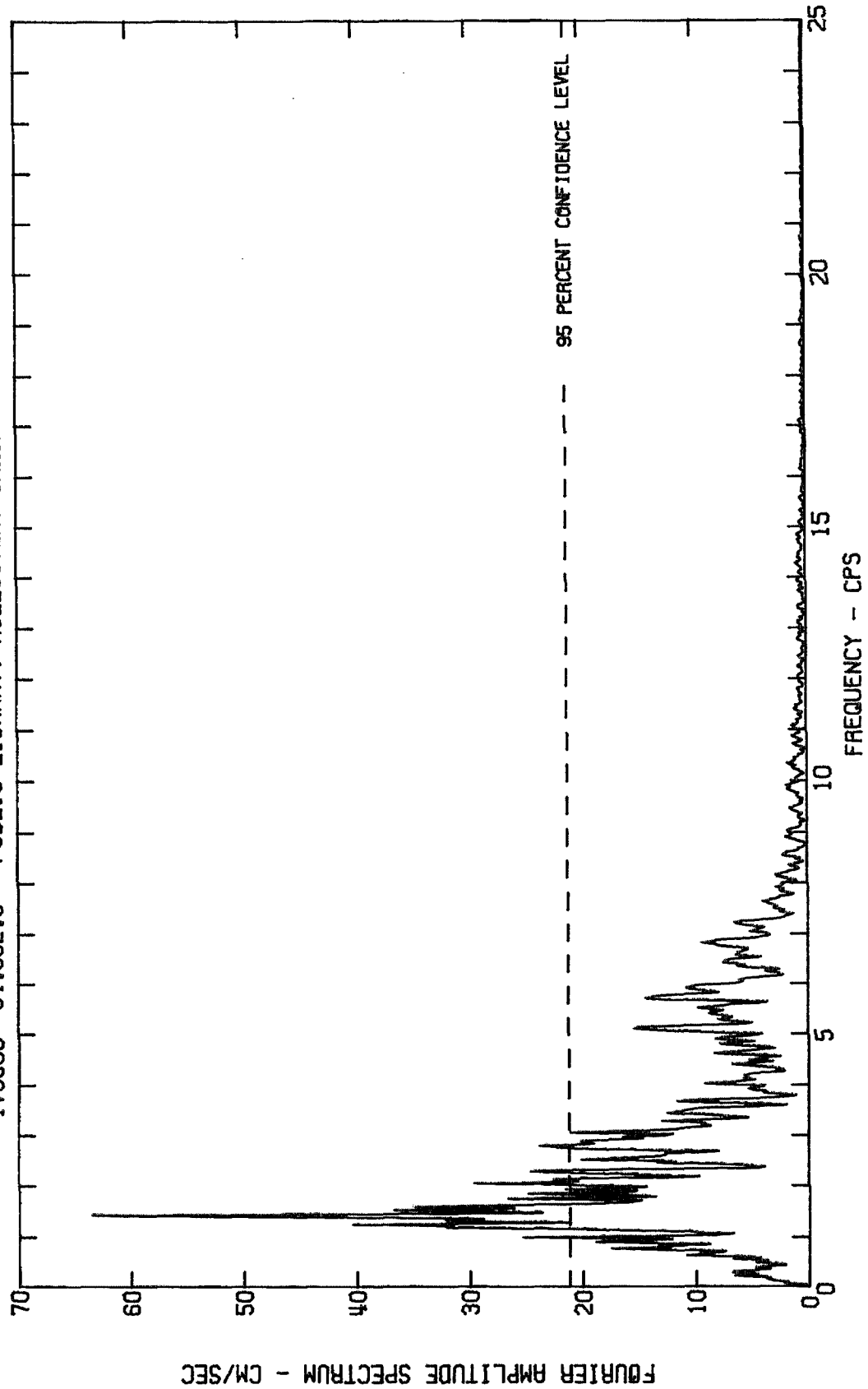
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EARTHQUAKE APR 25, 1954 - 1234 PST  
1VU305 54.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP N89W



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EARTHQUAKE APR 25, 1954 - 1234 PST  
IVU305 54.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP N89W

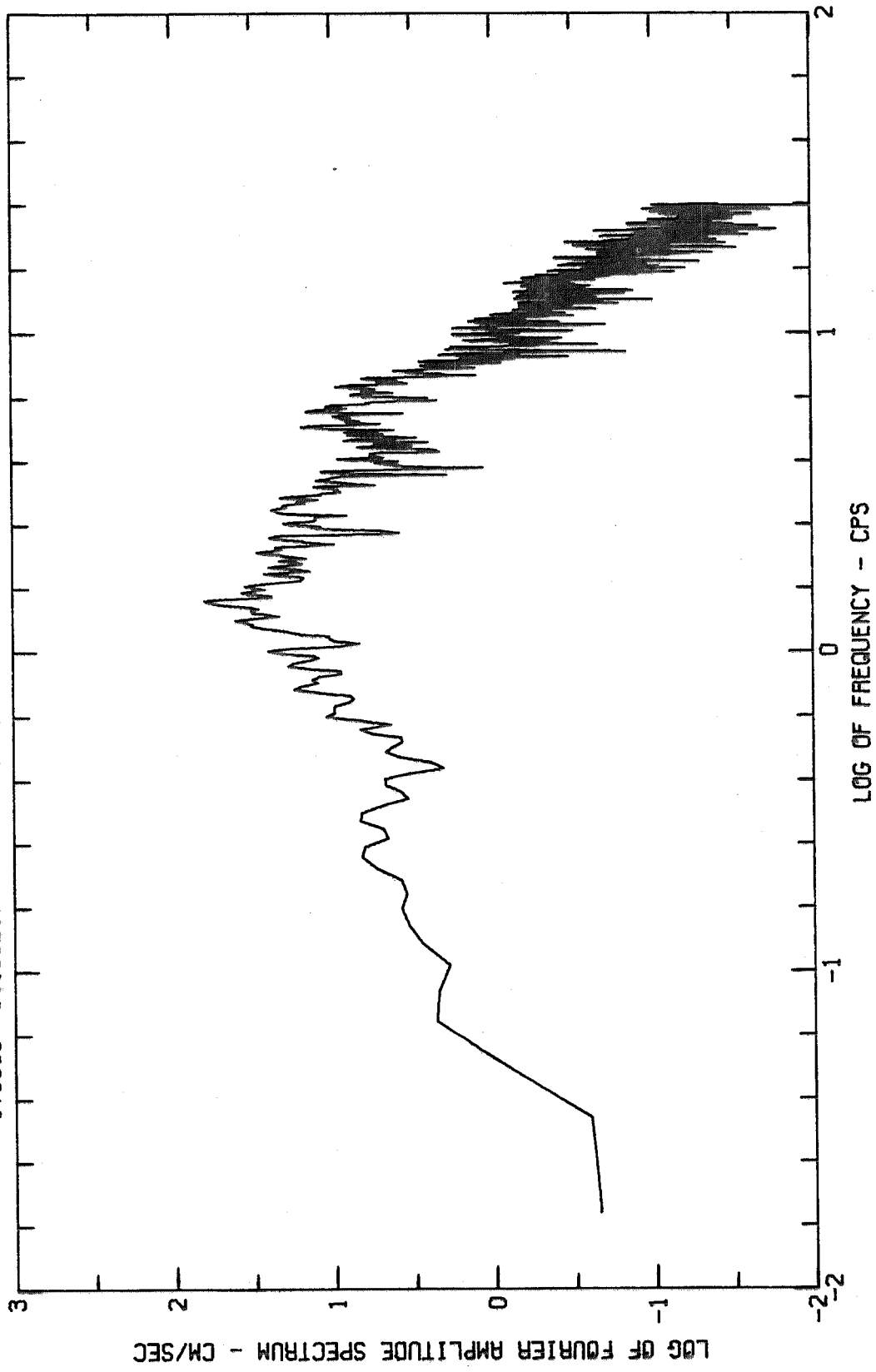


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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IVU305 54.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP SOIW

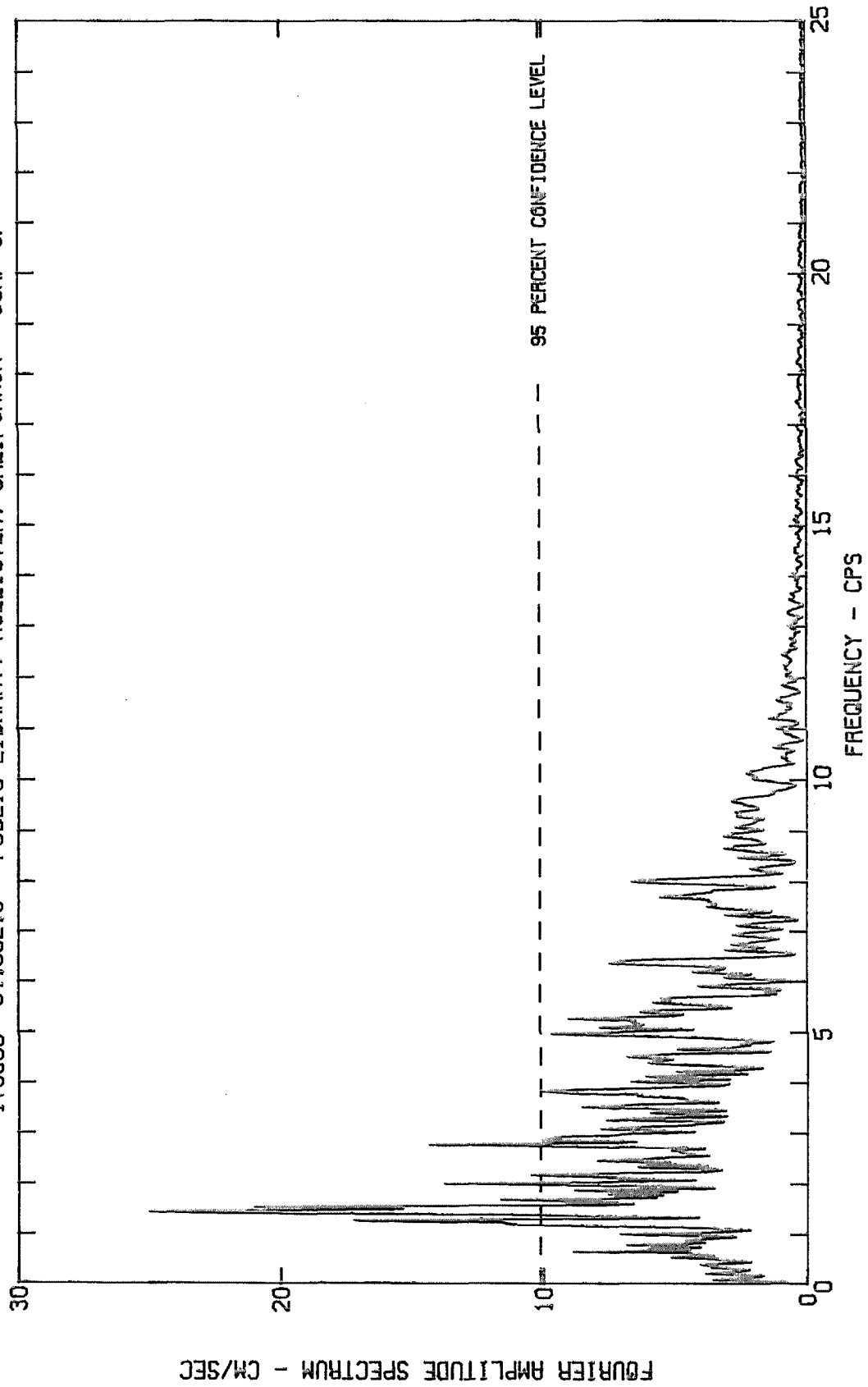




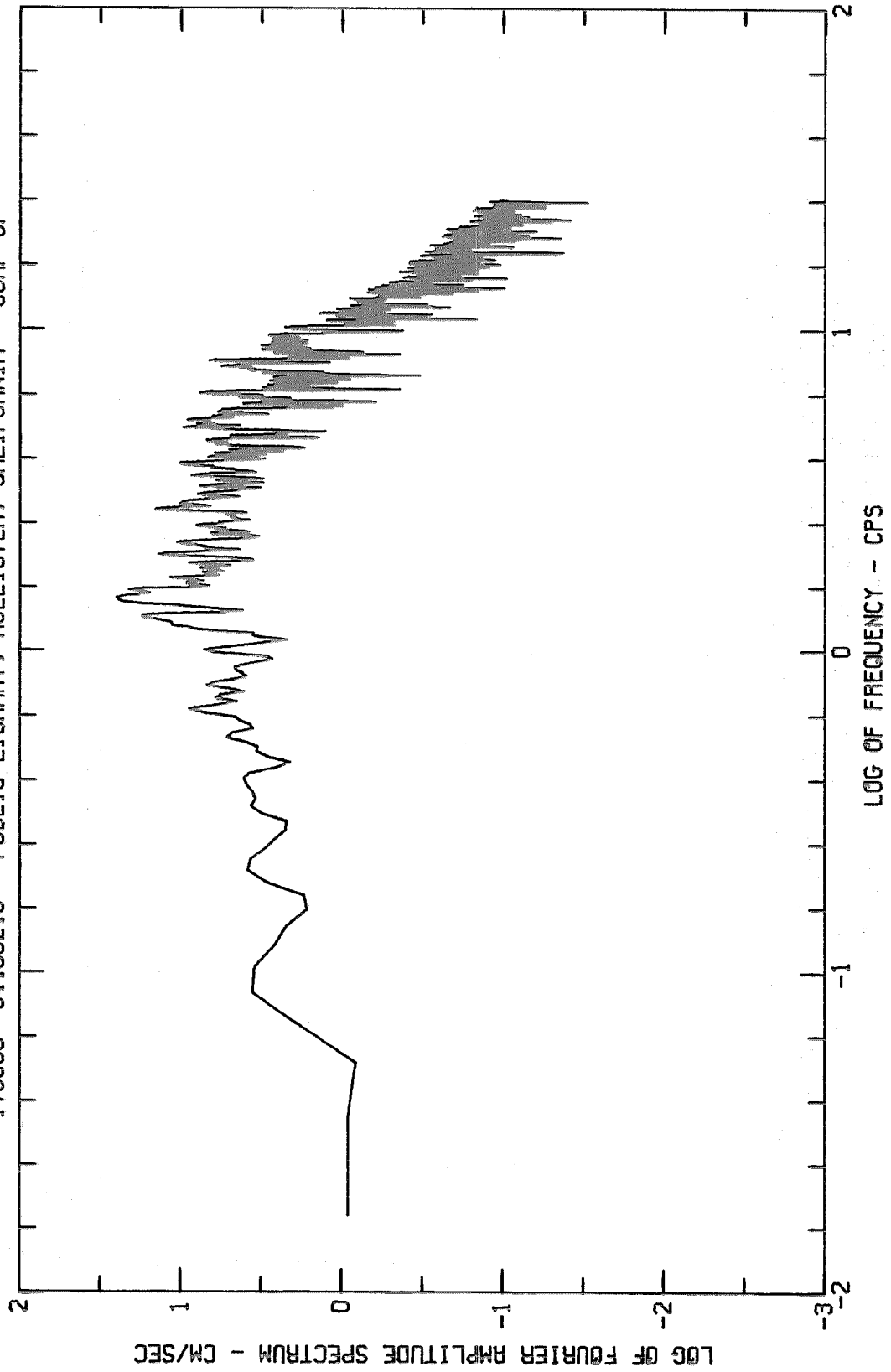
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CENTRAL CALIFORNIA EARTHQUAKE APR 25, 1954 - 1234 PST  
IVU305 54.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP S01W

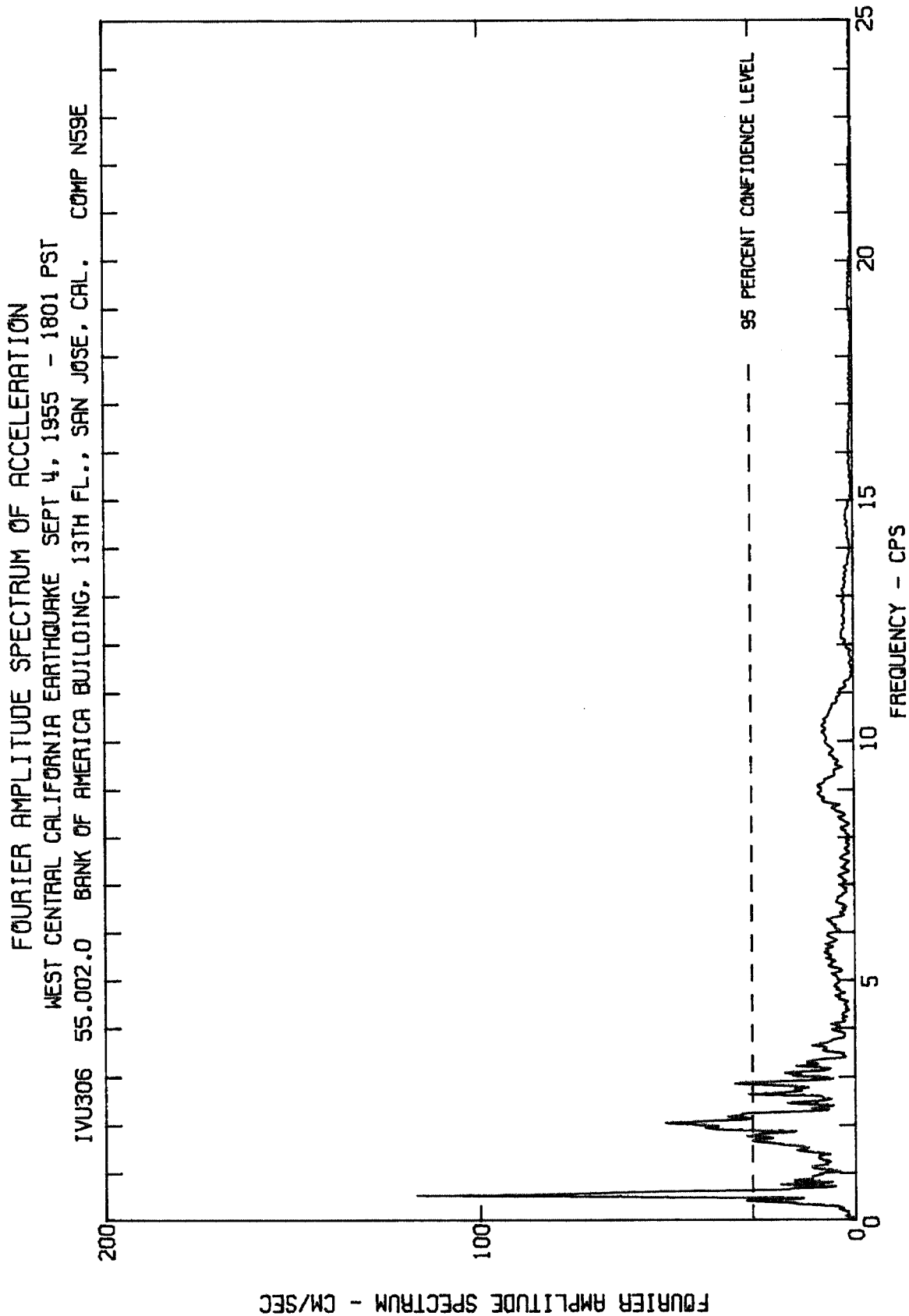


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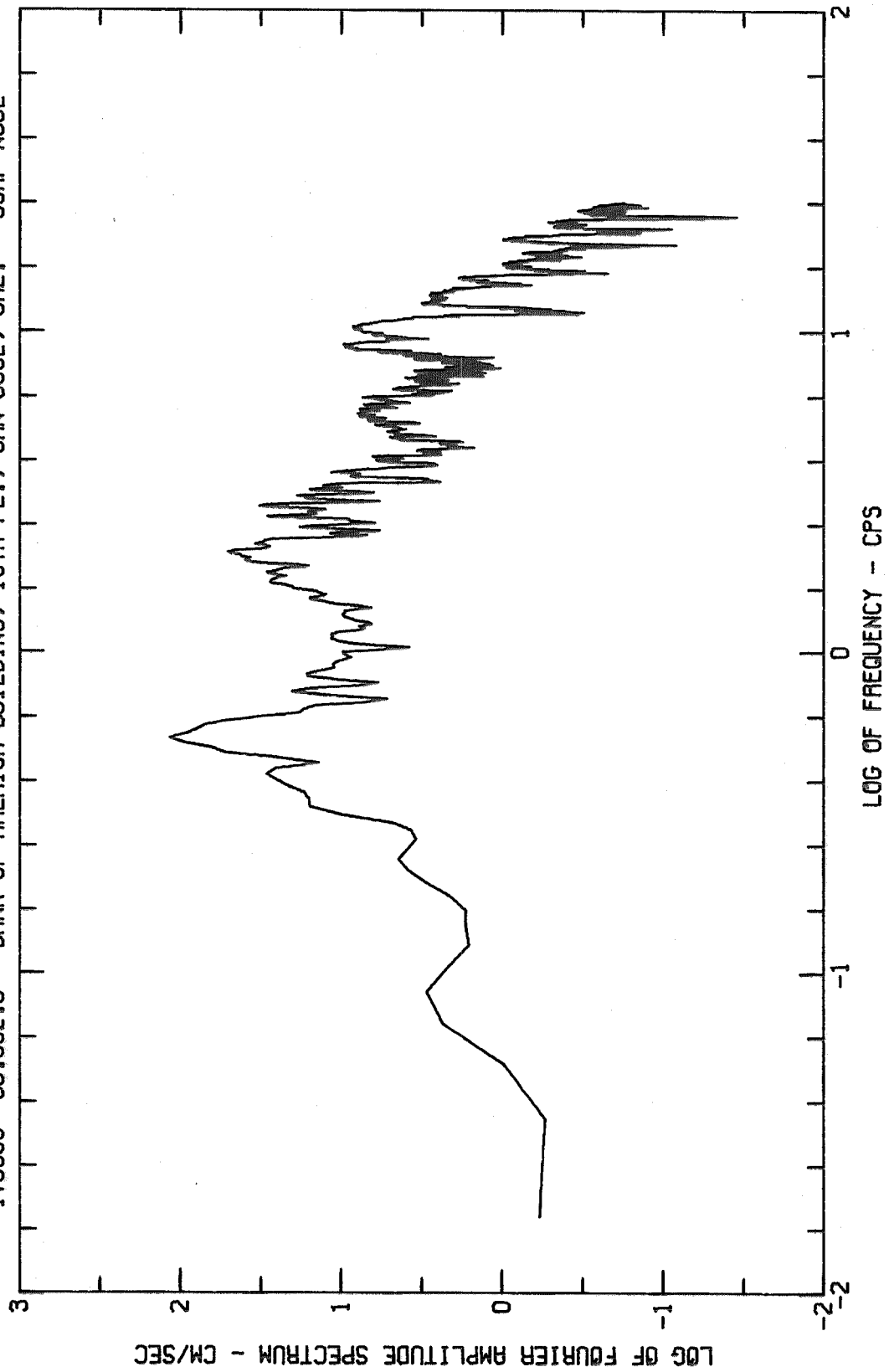


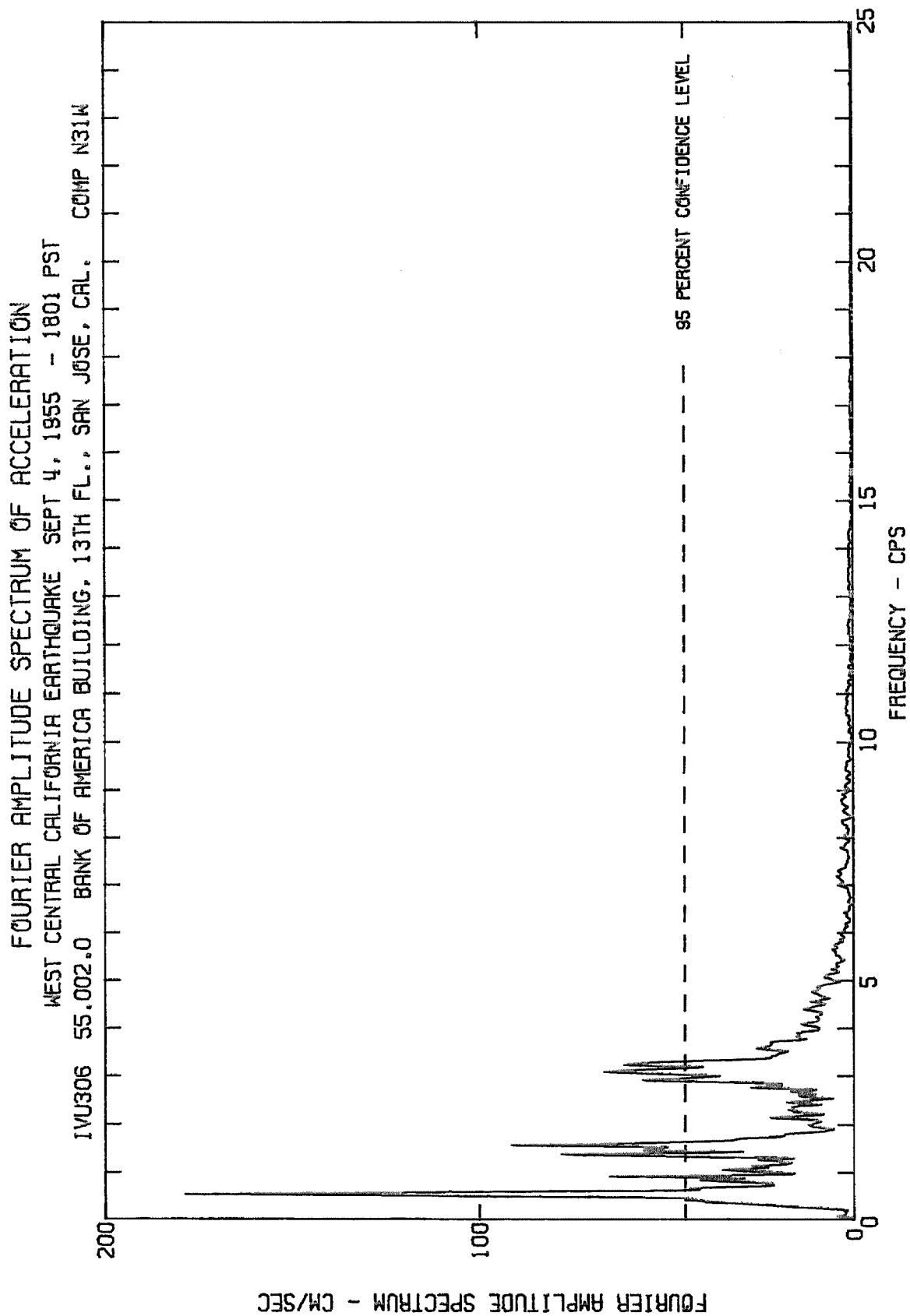
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CENTRAL CALIFORNIA EARTHQUAKE APR 25, 1954 - 1234 PST  
IVU305 54.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP UP



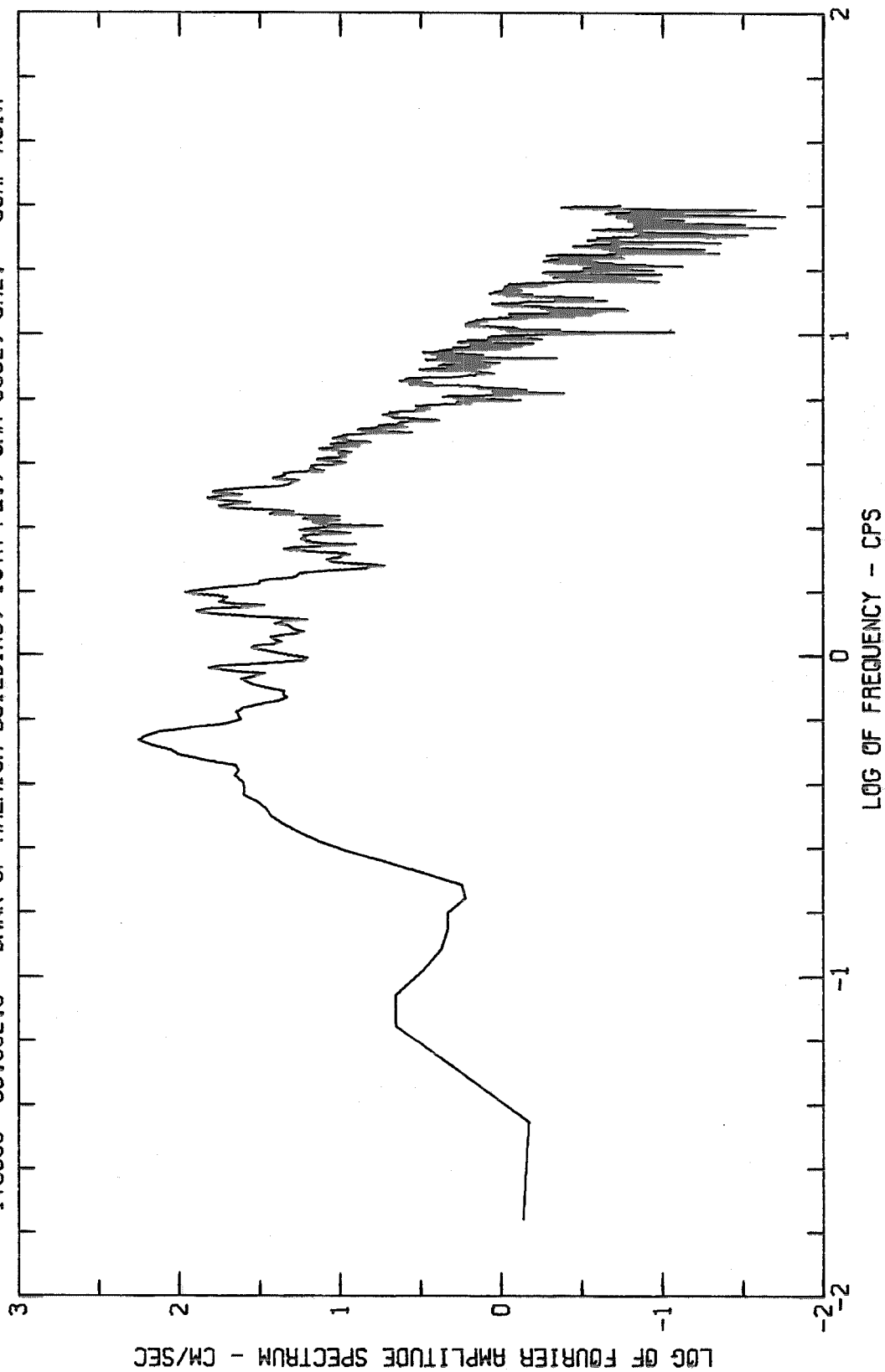


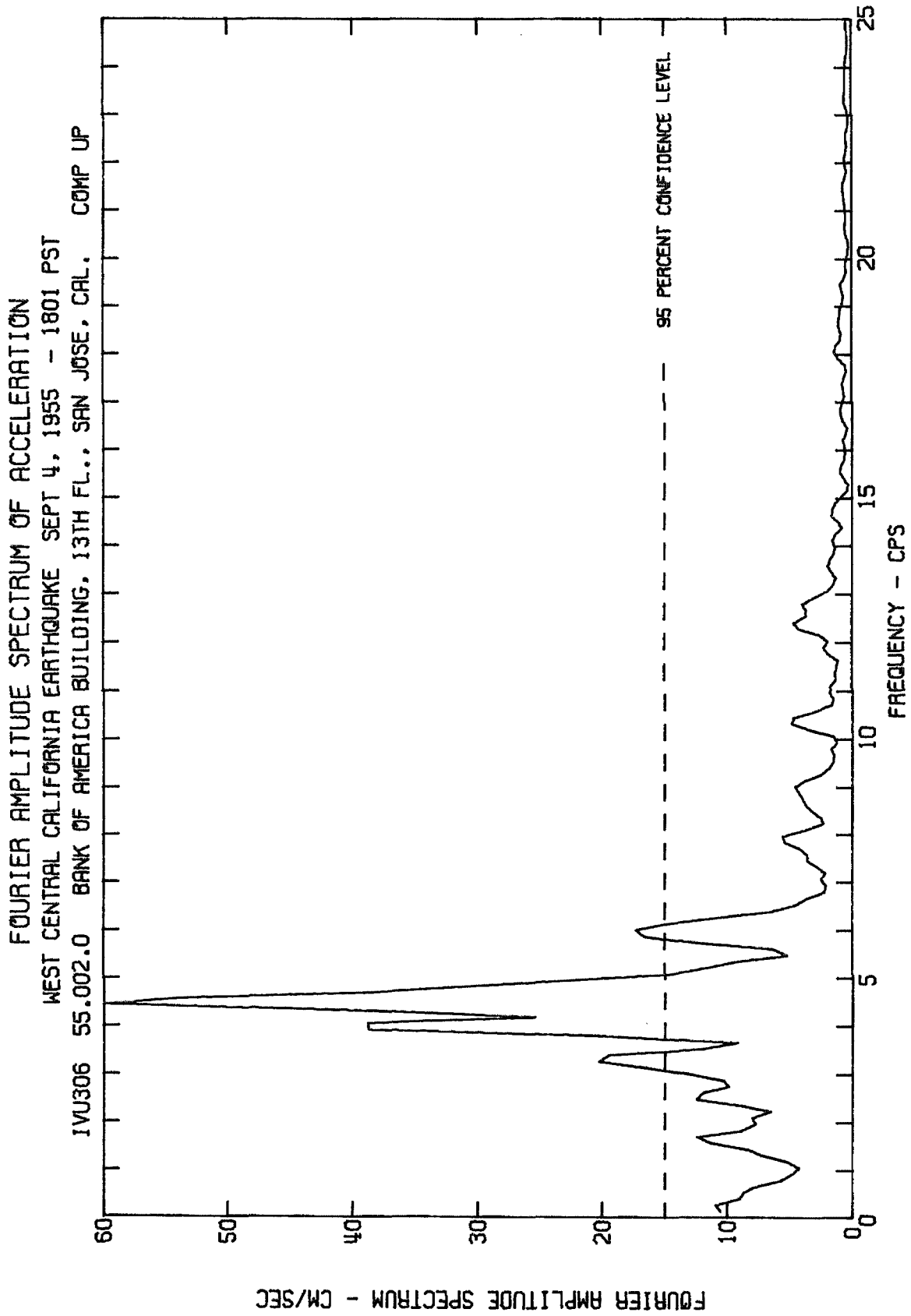
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
WEST CENTRAL CALIFORNIA EARTHQUAKE SEPT 4, 1955 - 1801 PST  
1VU306 55.002.0 BANK OF AMERICA BUILDING, 13TH FL., SAN JOSE, CAL. COMP N59E





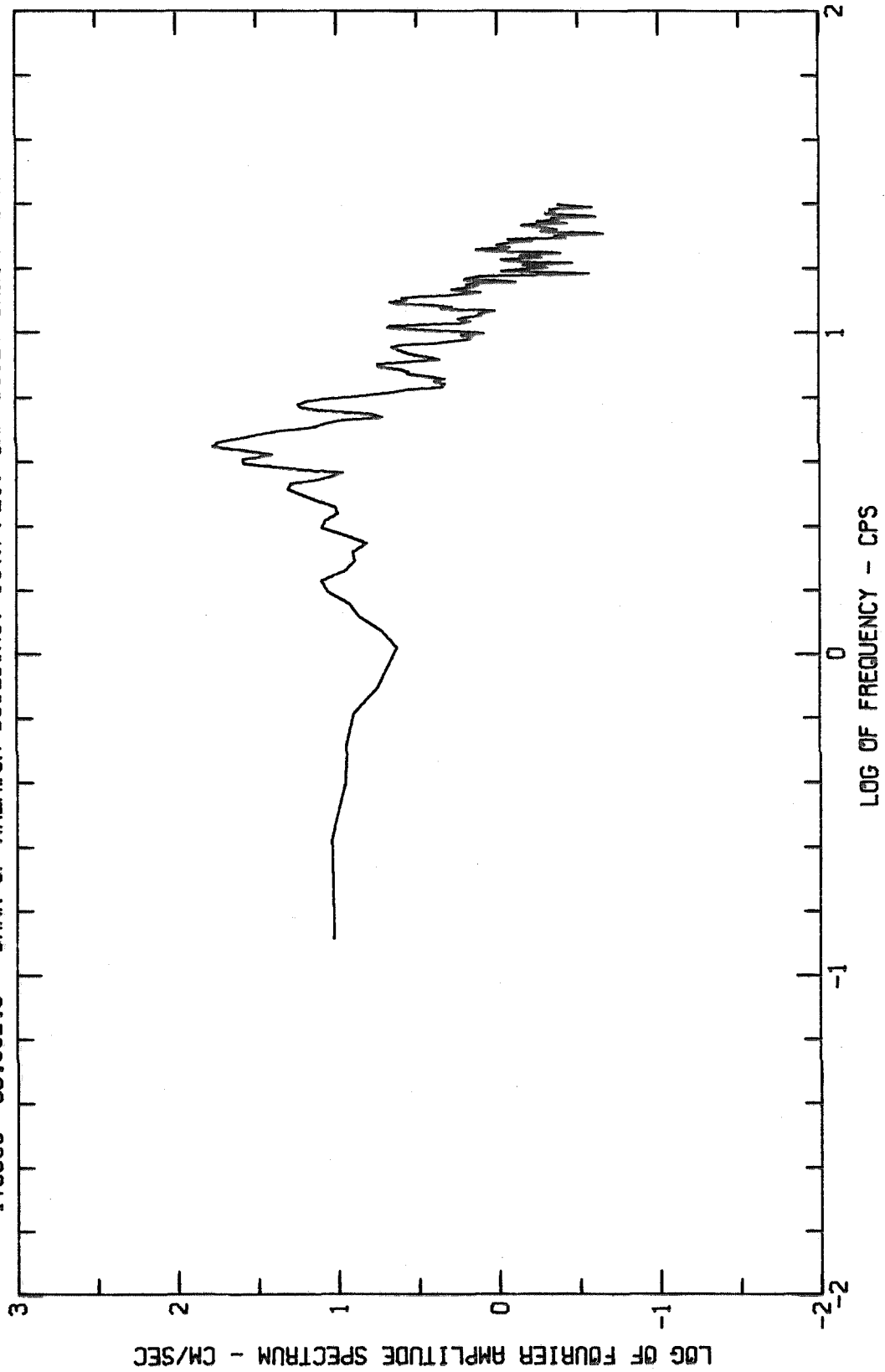
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1VU306 55.002.0 BANK OF AMERICA BUILDING, 13TH FL., SAN JOSE, CAL. COMP N31W



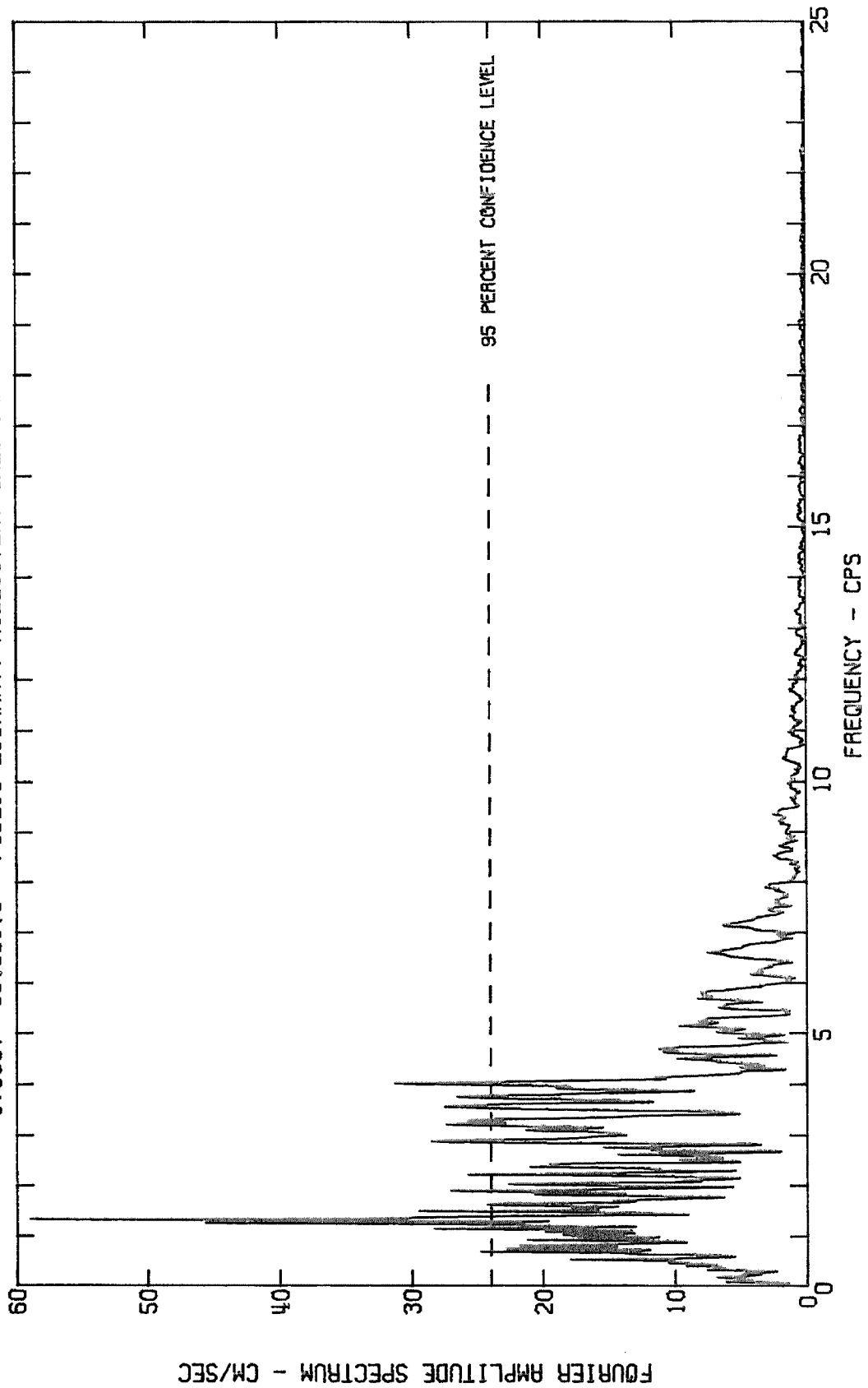




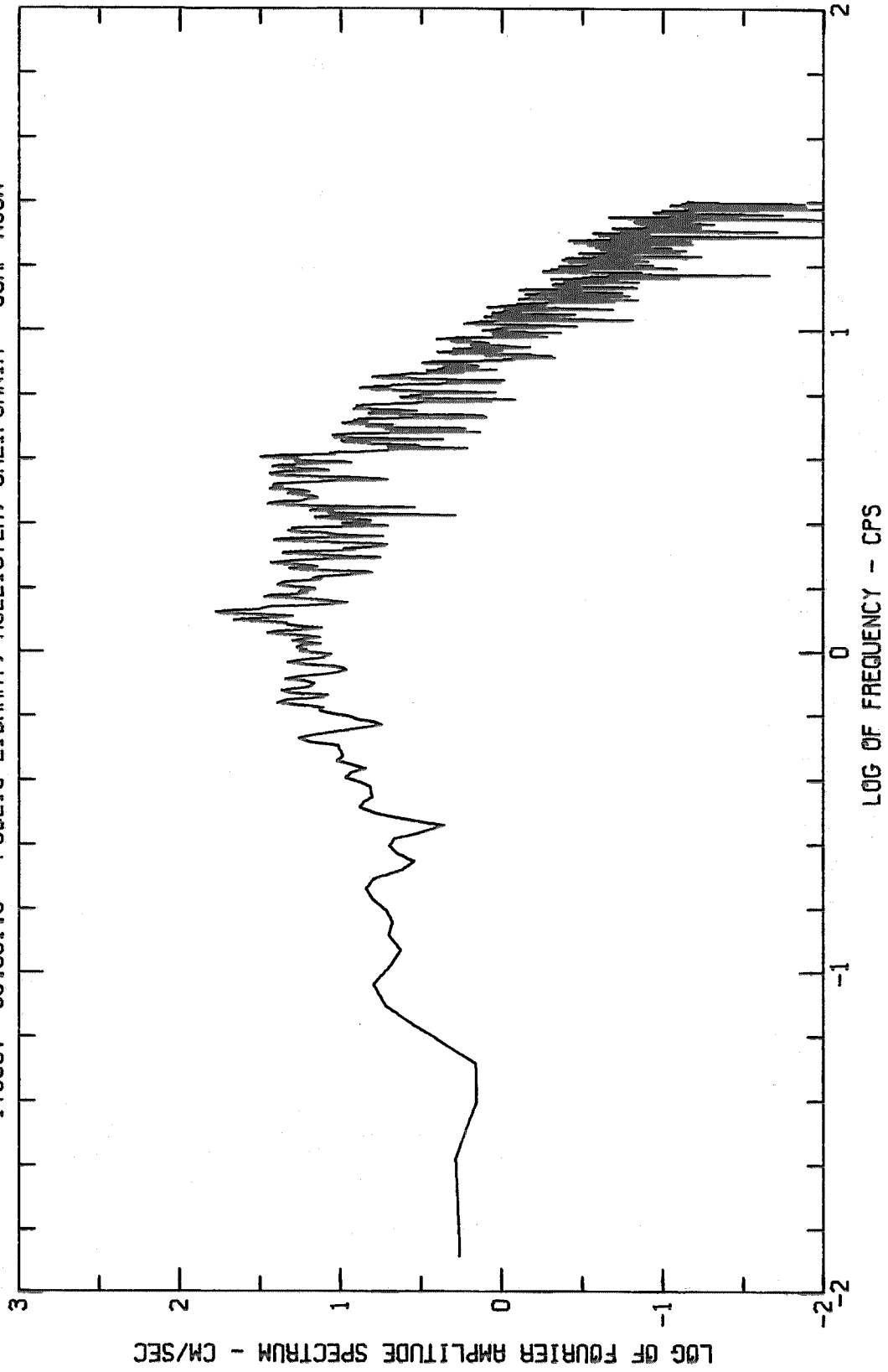
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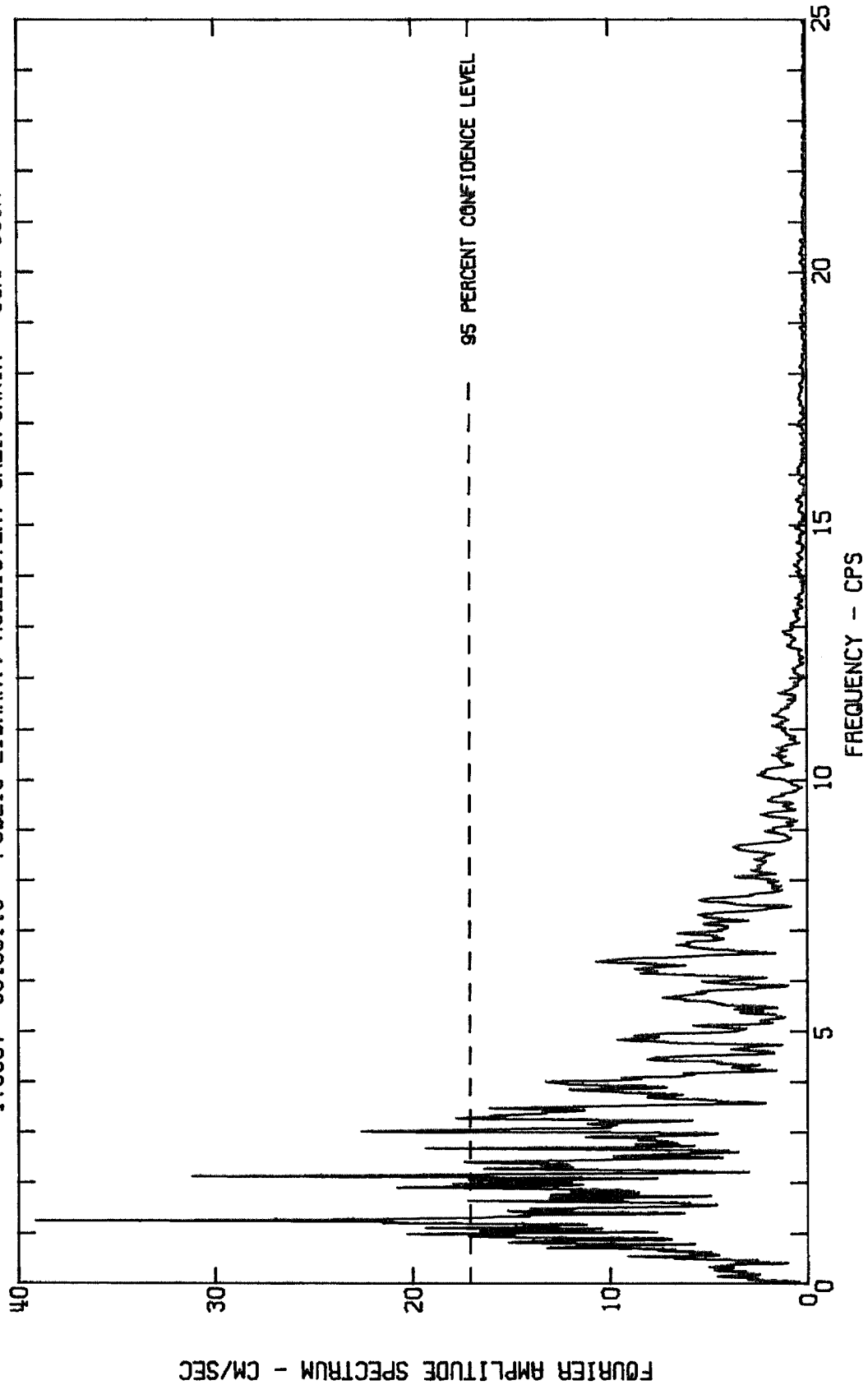
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EARTHQUAKE JAN 19, 1960 - 1926 PST  
IVU307 60.001.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP N89W



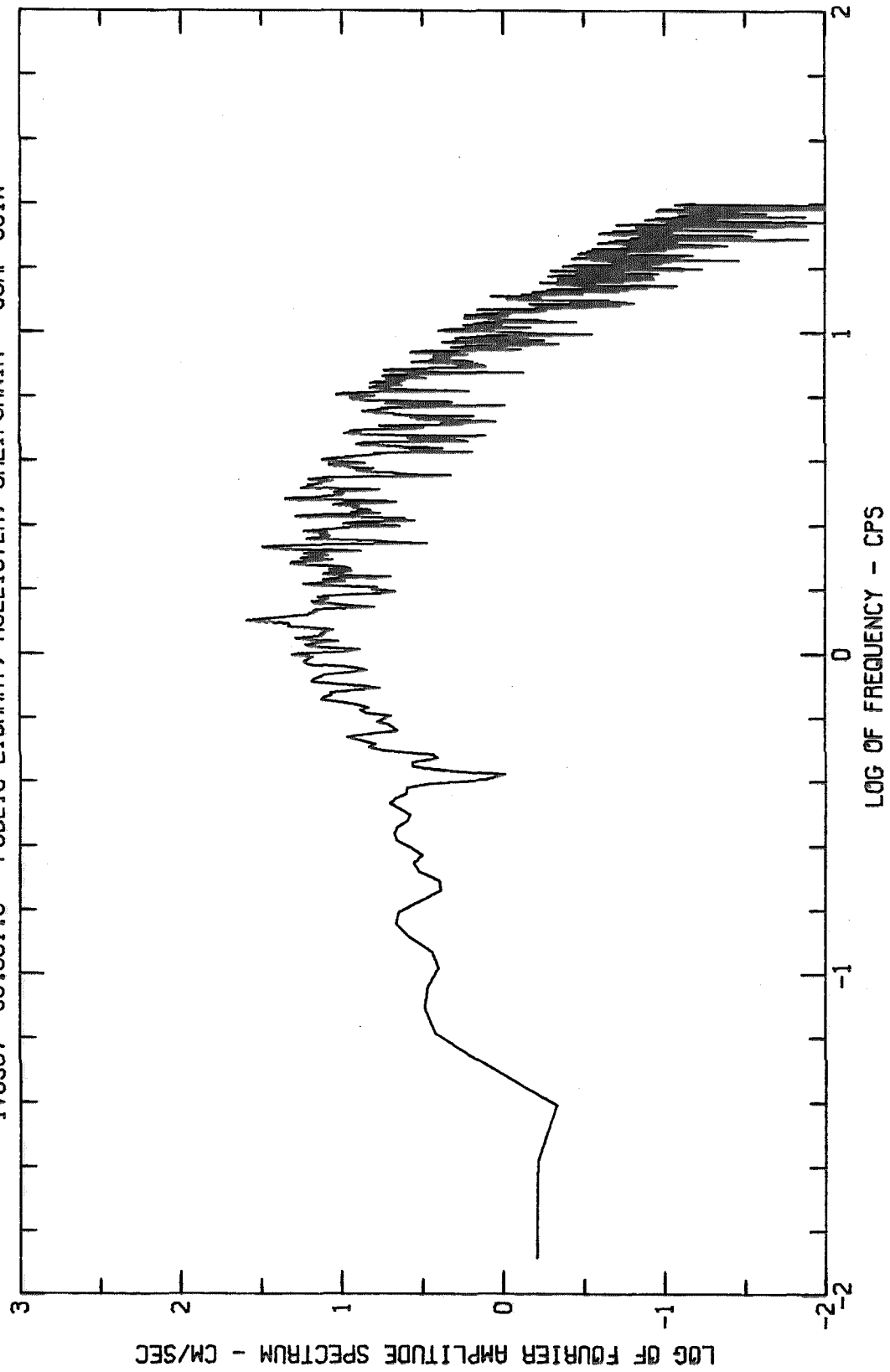
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CENTRAL CALIFORNIA EARTHQUAKE JAN 19, 1960 - 1926 PST  
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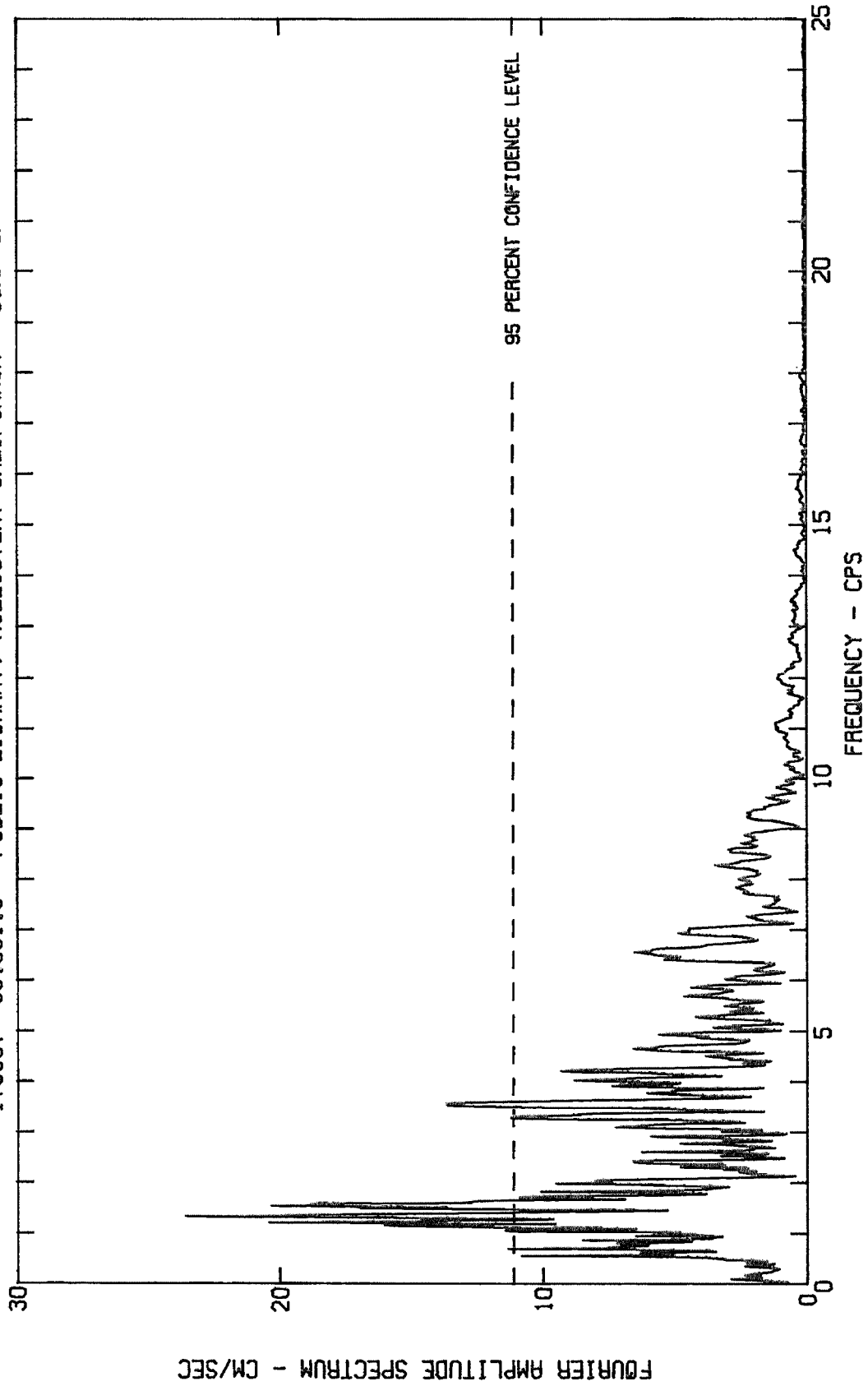
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CENTRAL CALIFORNIA EARTHQUAKE JAN 19, 1960 - 1926 PST  
JVU307 60.001.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP S01W



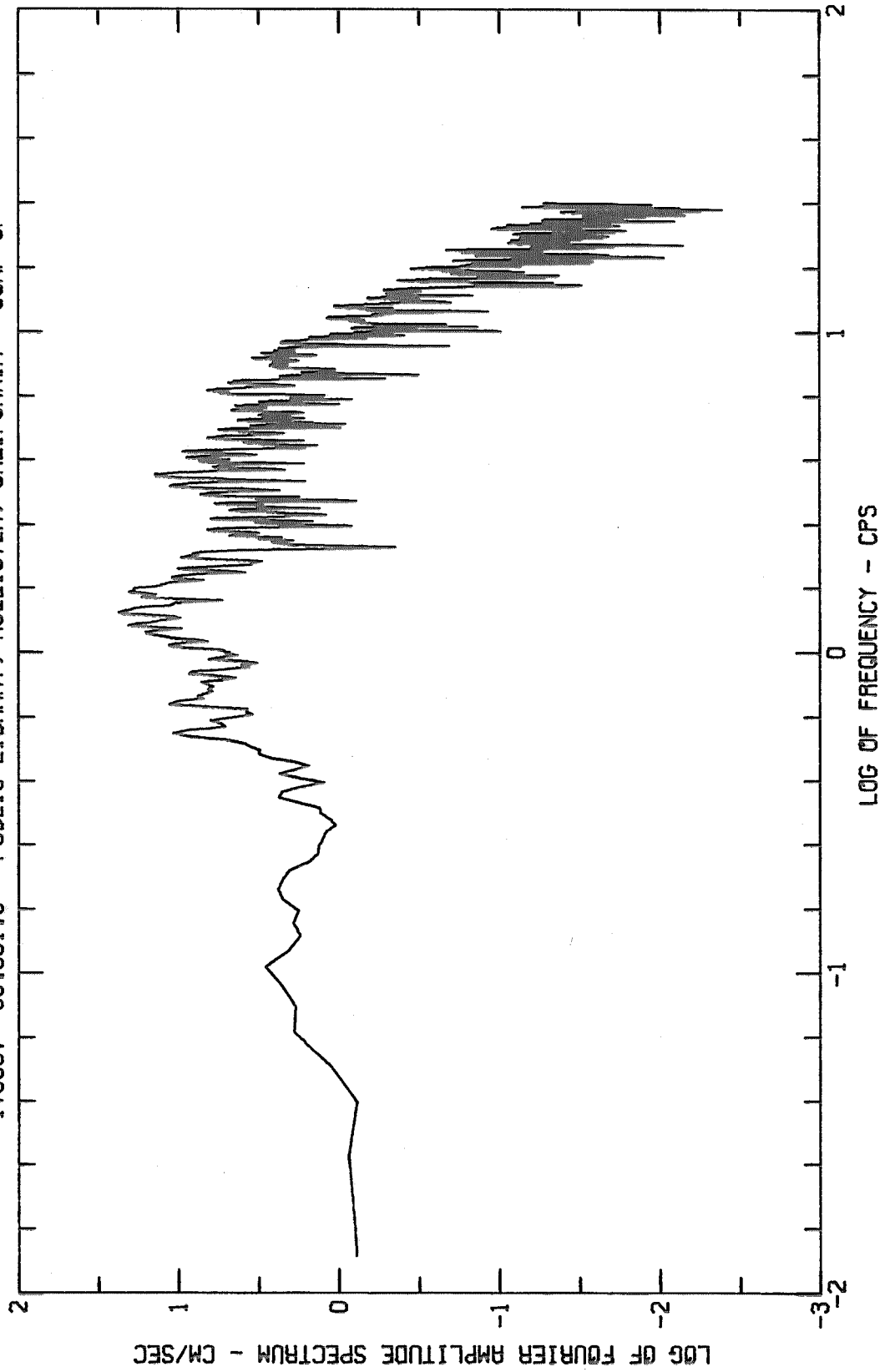
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CENTRAL CALIFORNIA EARTHQUAKE JAN 19, 1960 - 1926 PST  
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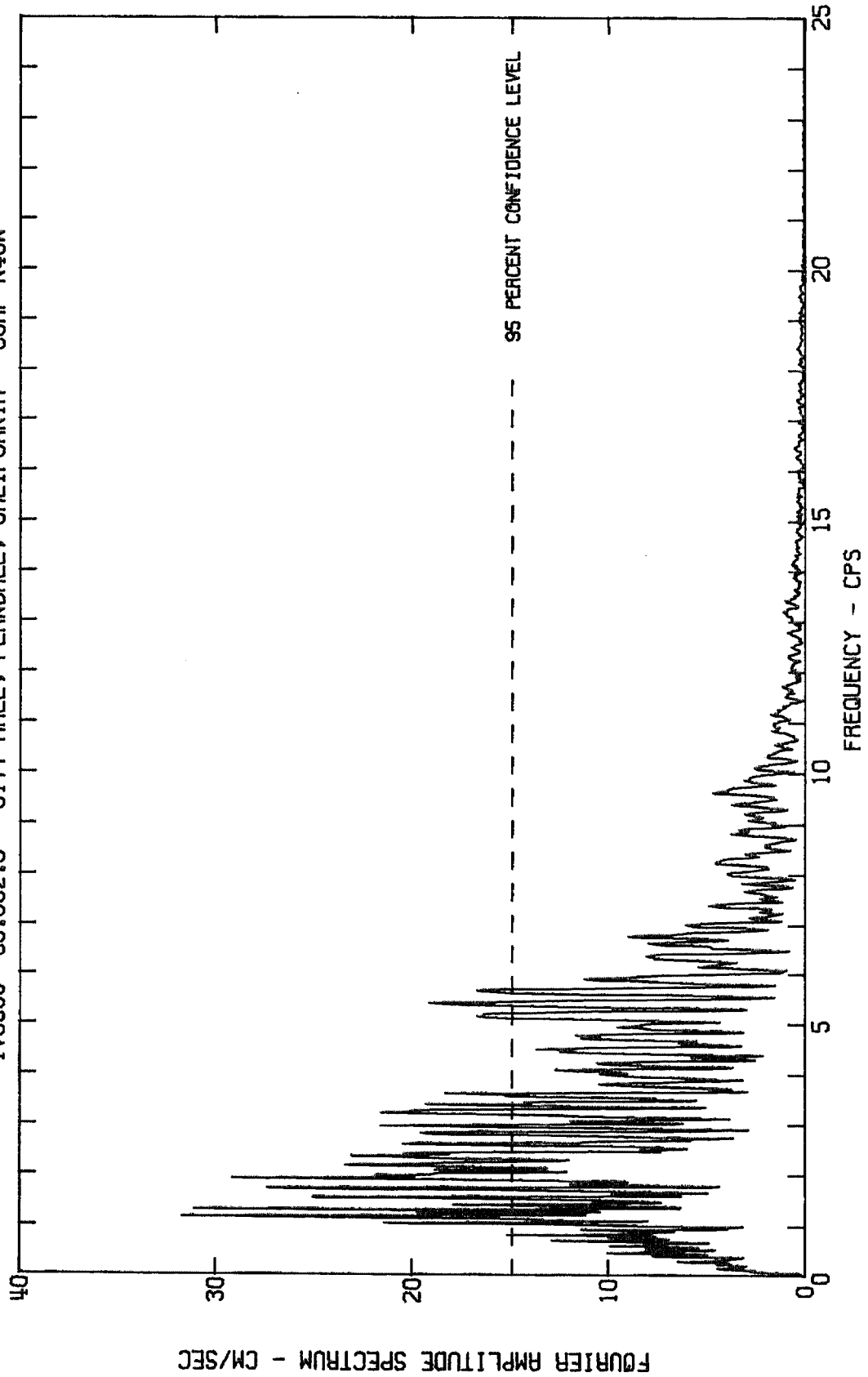
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CENTRAL CALIFORNIA EARTHQUAKE JAN 19, 1960 - 1926 PST  
IVU307 60.001.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP UP



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EARTHQUAKE JAN 19, 1960 - 1926 PST  
1VU307 60.001.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP UP

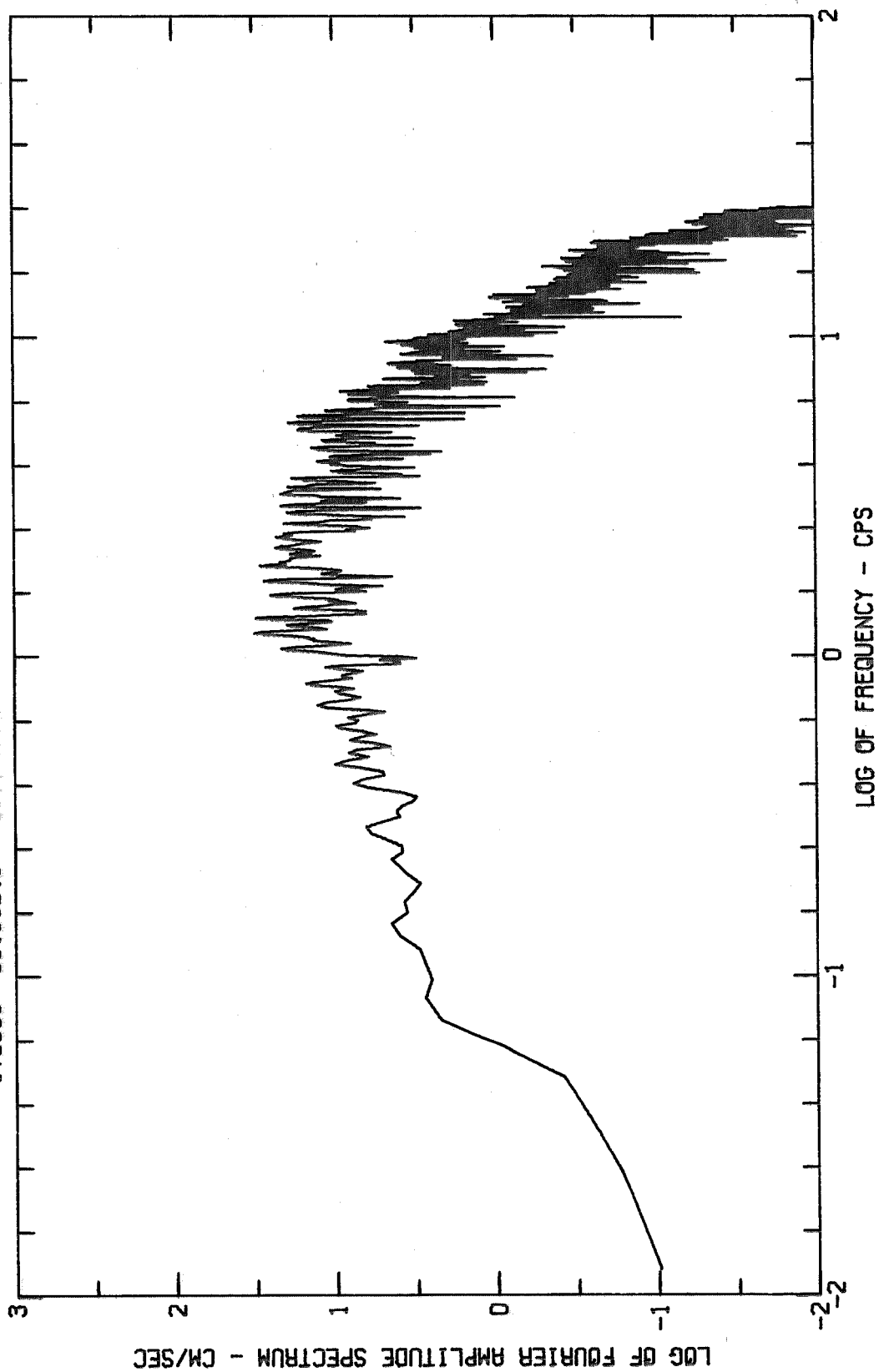


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
NORTHERN CALIFORNIA EARTHQUAKE JUN 5, 1960 - 1718 PST  
IVU308 60.002.0 CITY HALL, FERNDALE, CALIFORNIA COMP N46W

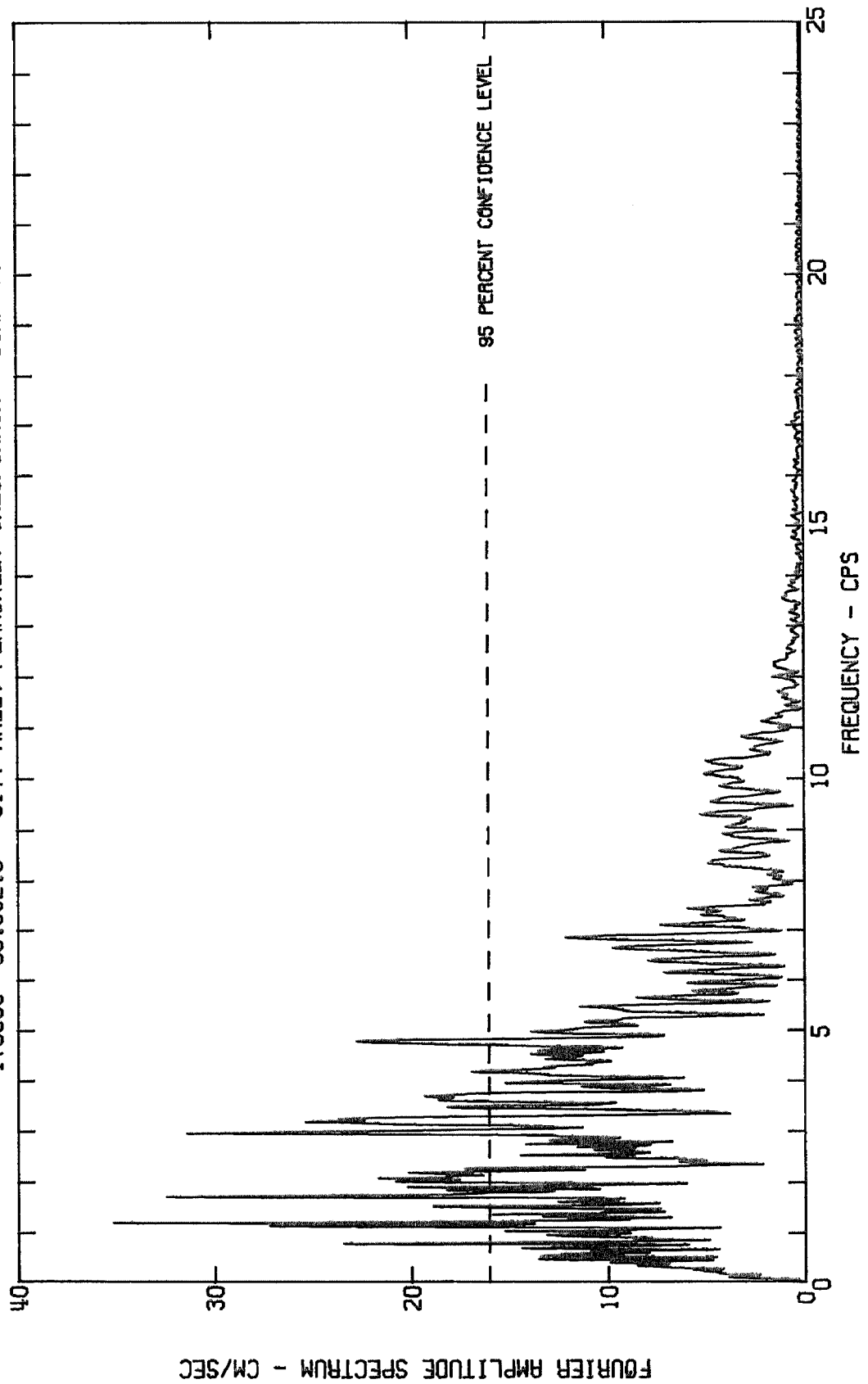




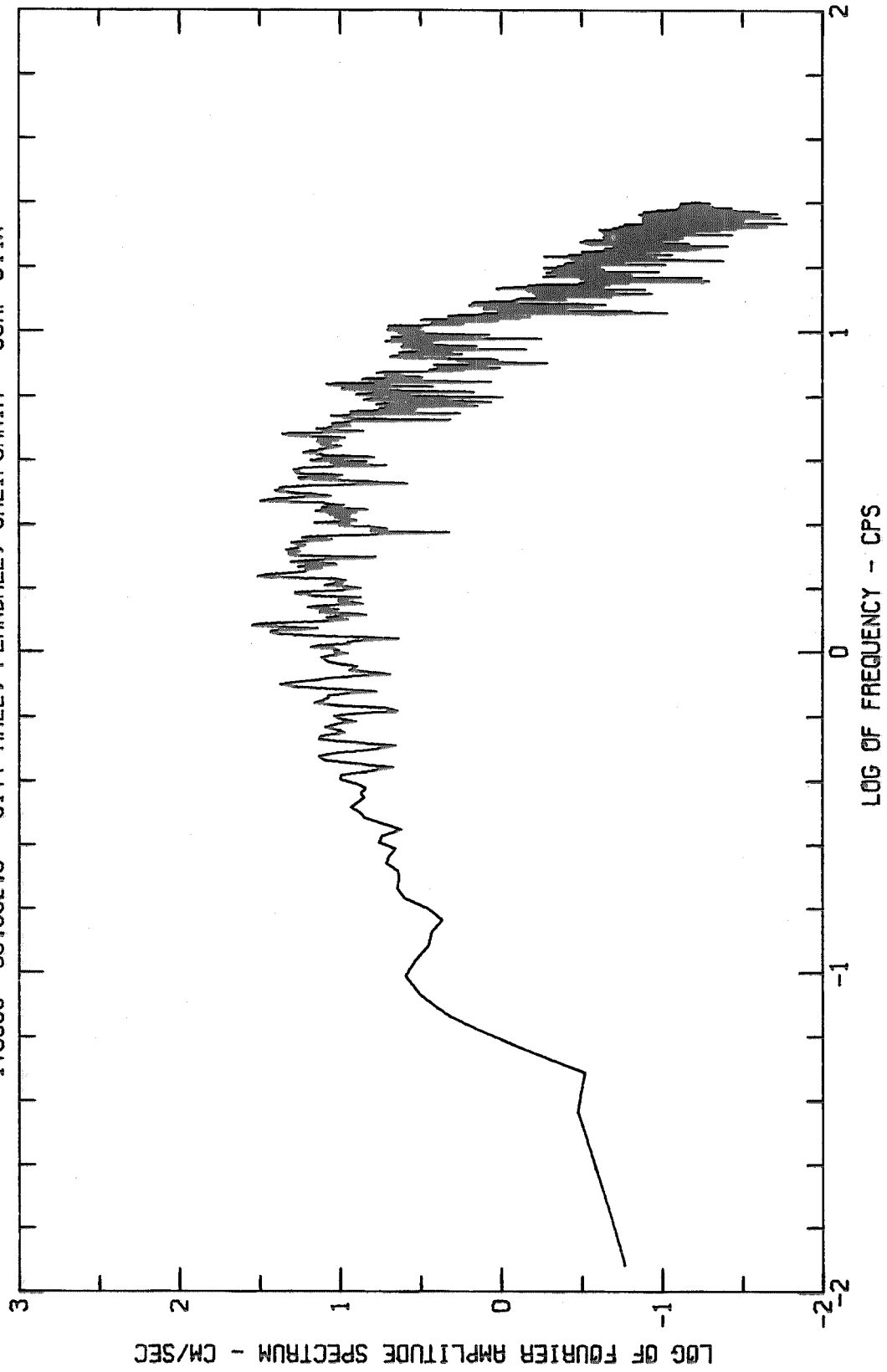
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
NORTHERN CALIFORNIA EARTHQUAKE JUN 5, 1960 - 1718 PST  
IVU308 60.002.0 CITY HALL, FERNDALE, CALIFORNIA COMP N46W



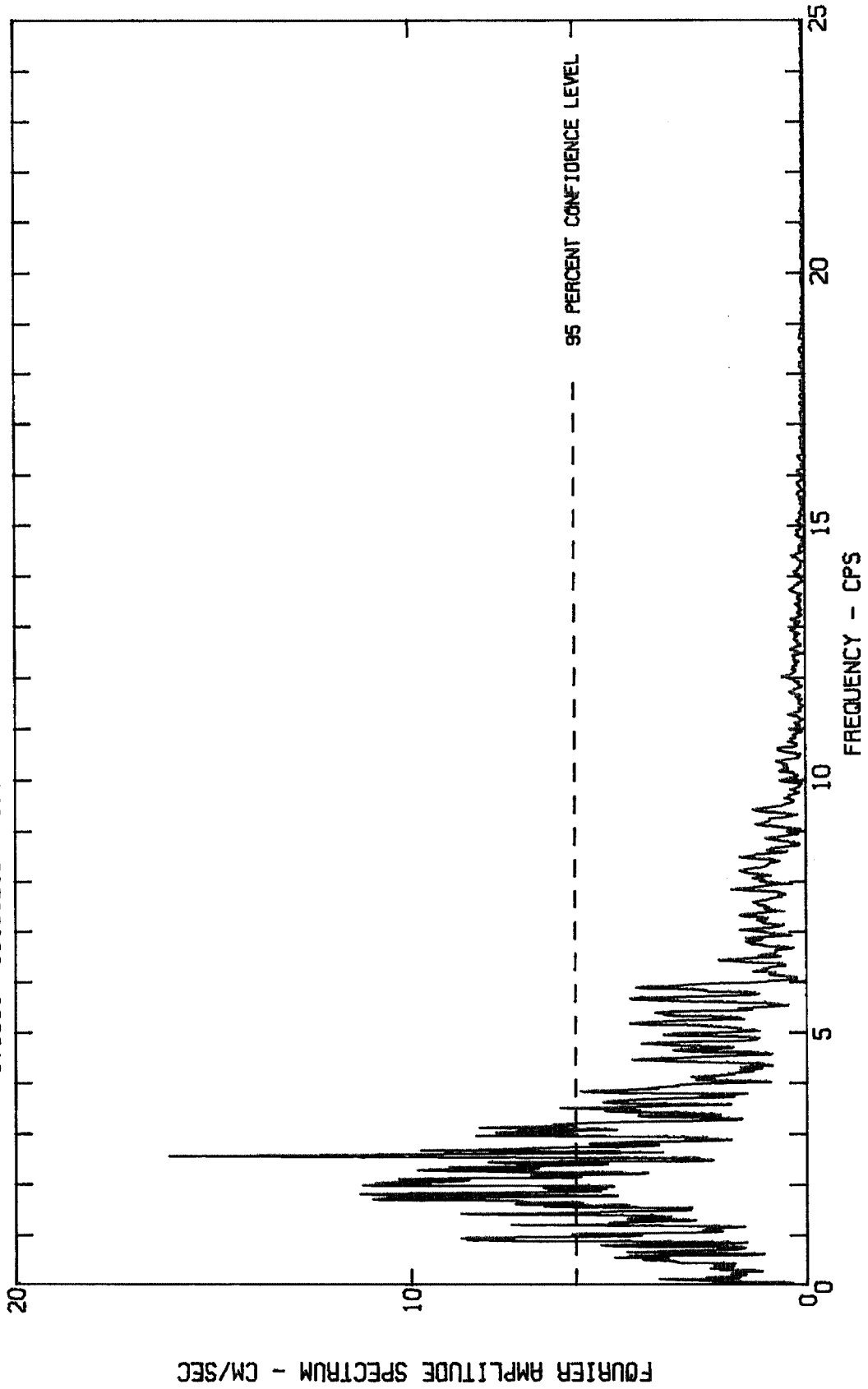
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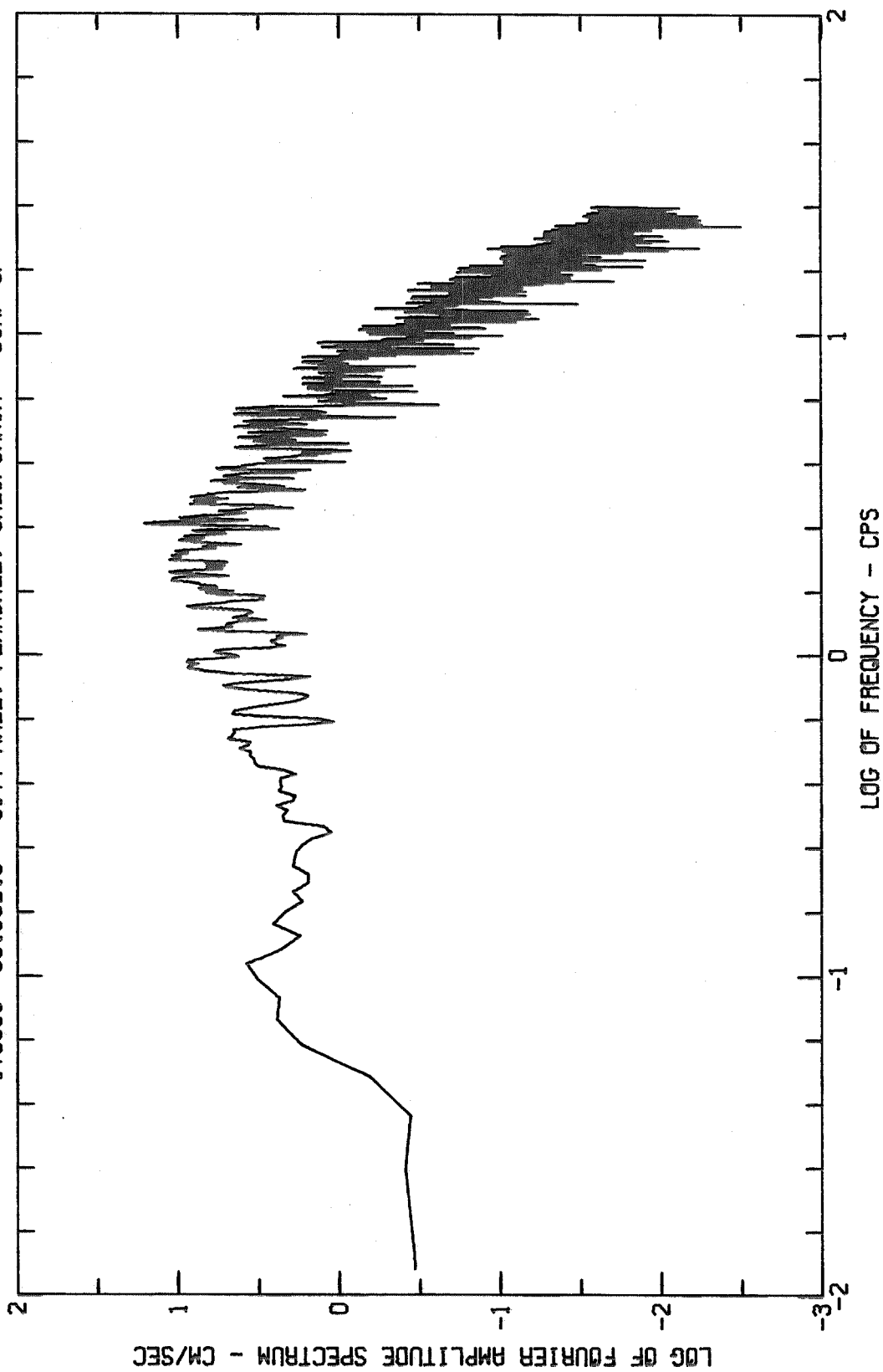
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NORTHERN CALIFORNIA EARTHQUAKE JUN 5, 1960 - 1718 PST  
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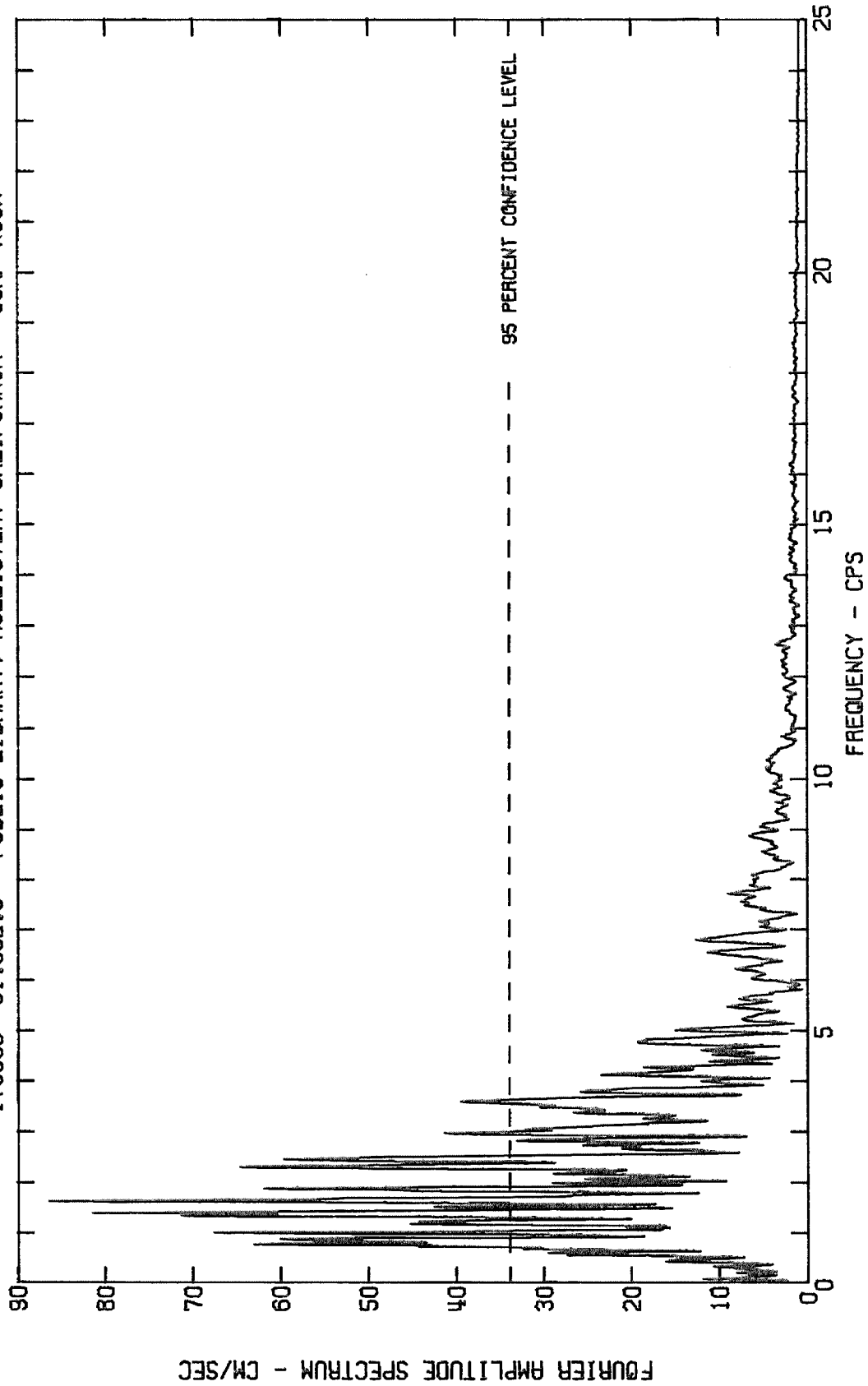
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
NORTHERN CALIFORNIA EARTHQUAKE JUN 5, 1960 - 1718 PST  
1VU308 60.002.0 CITY HALL, FERNDALE, CALIFORNIA COMP UP



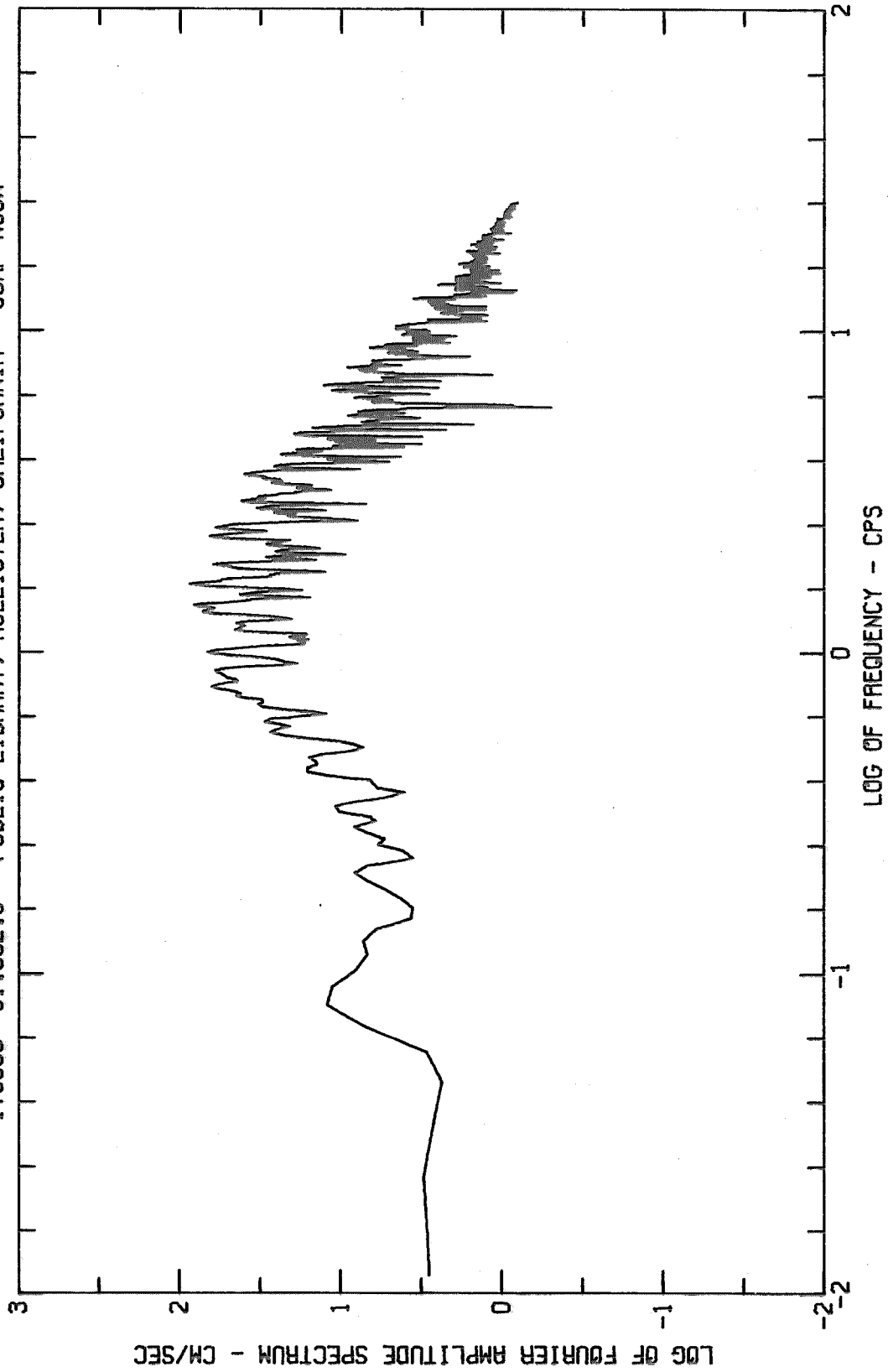
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NORTHERN CALIFORNIA EARTHQUAKE JUN 5, 1960 - 1718 PST  
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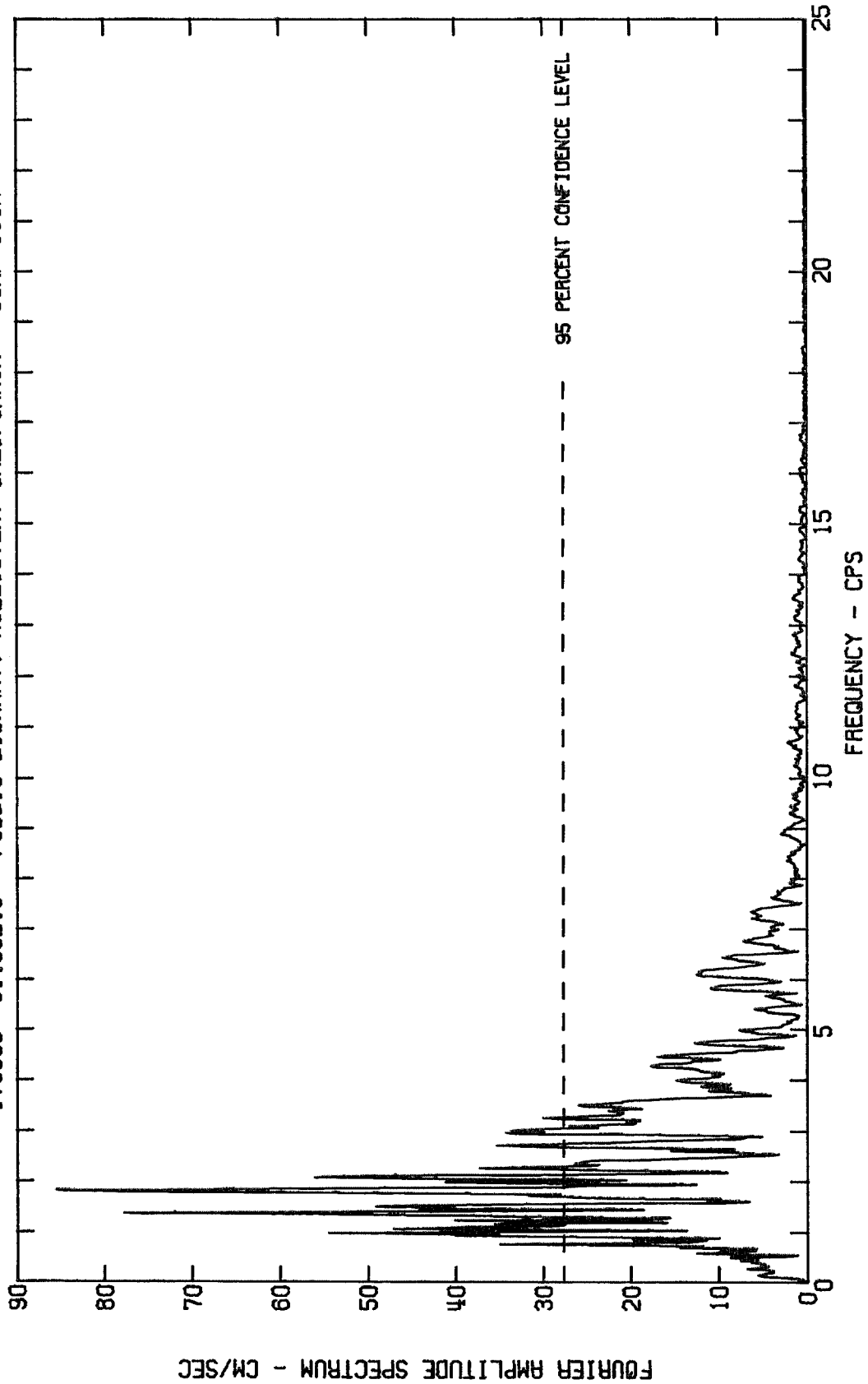
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EQ. AFTERSHOCK APR 8, 1961 - 2325 PST  
1VU308 61.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP N89W



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EQ. AFTERSHOCK APR 8, 1961 - 2325 PST  
IVU309 61.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP N89W

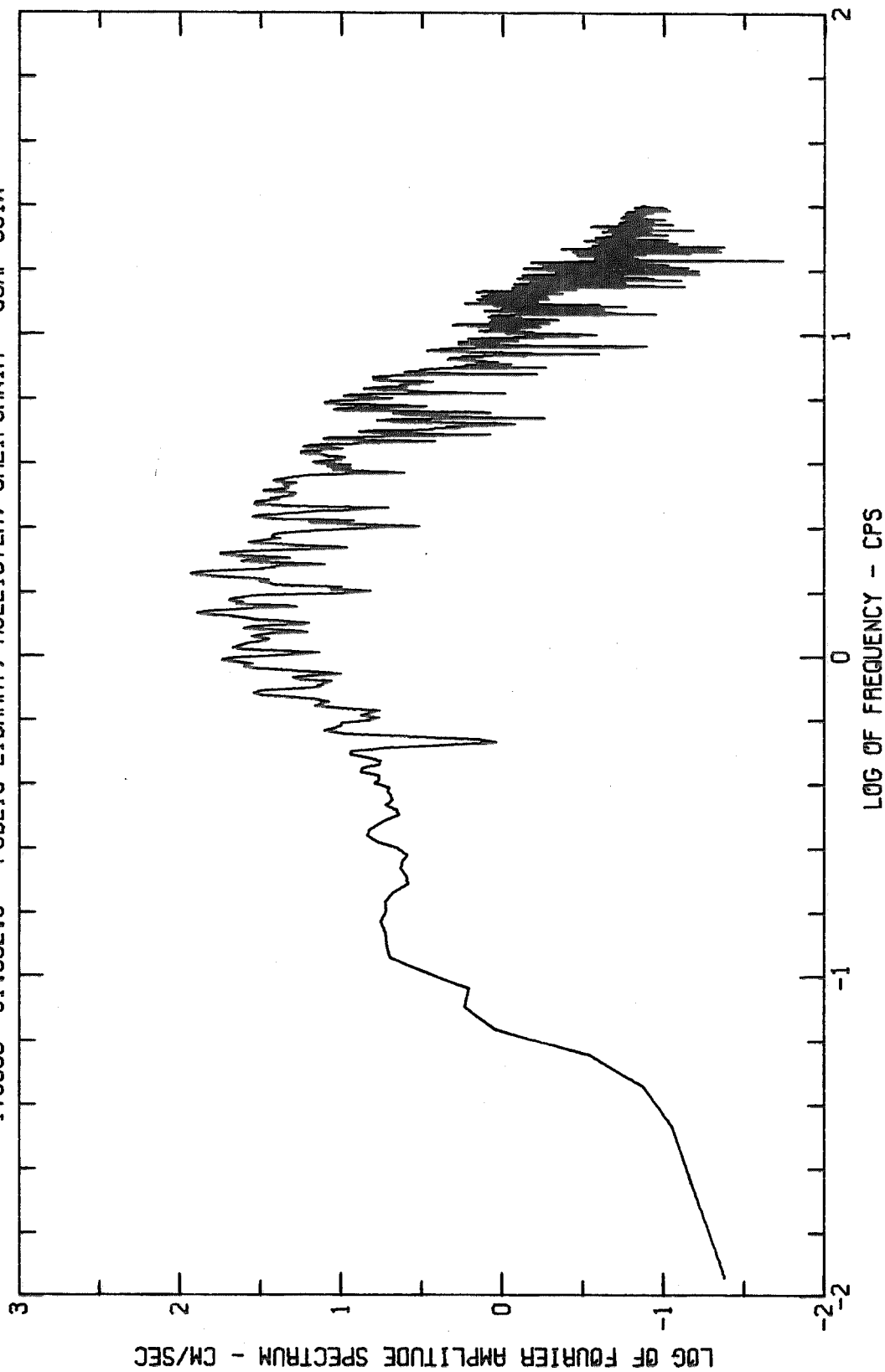


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
CENTRAL CALIFORNIA EQ. AFTERSHOCK APR 8, 1961 - 2325 PST  
IVU309 61.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP S01W

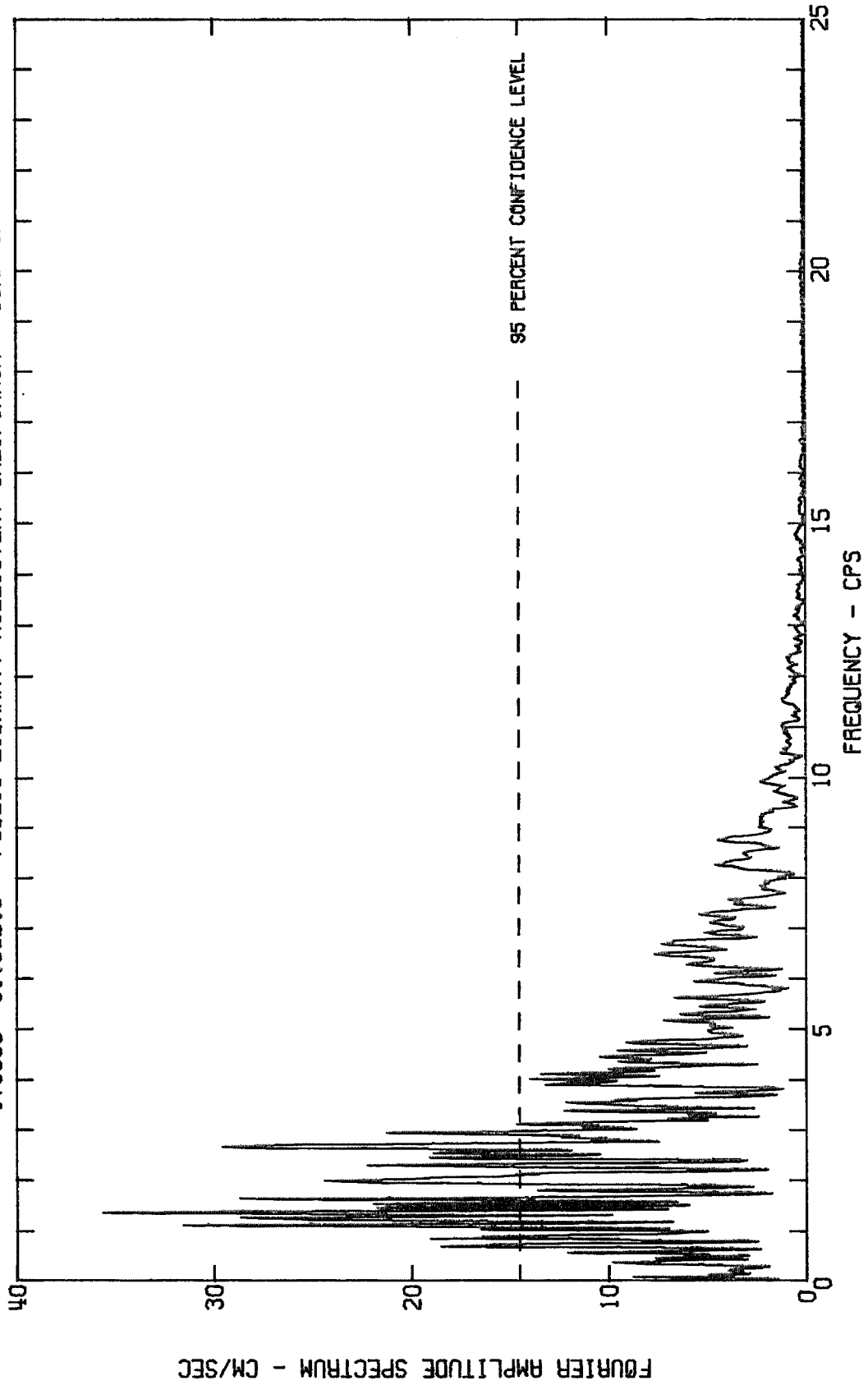




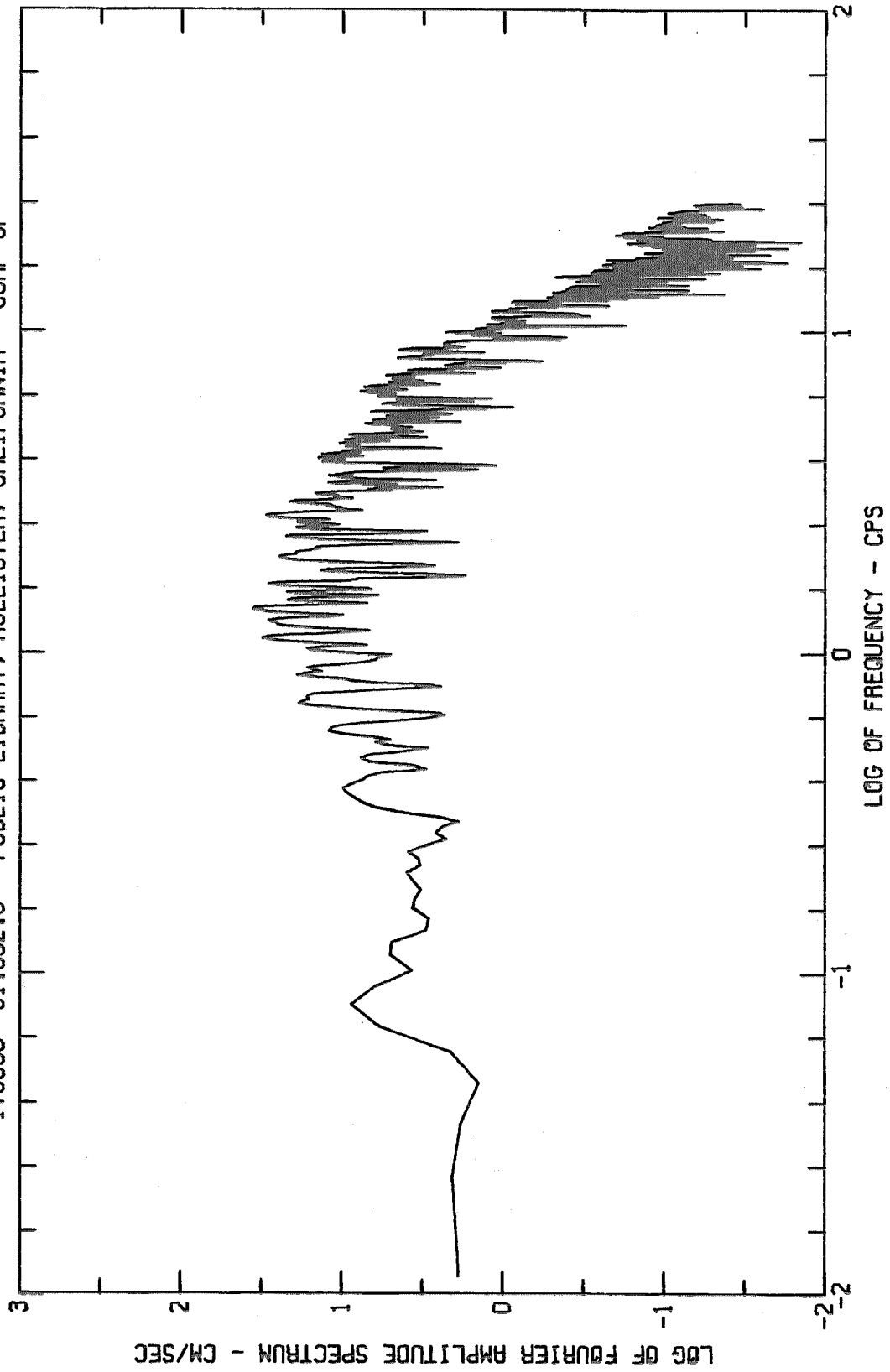
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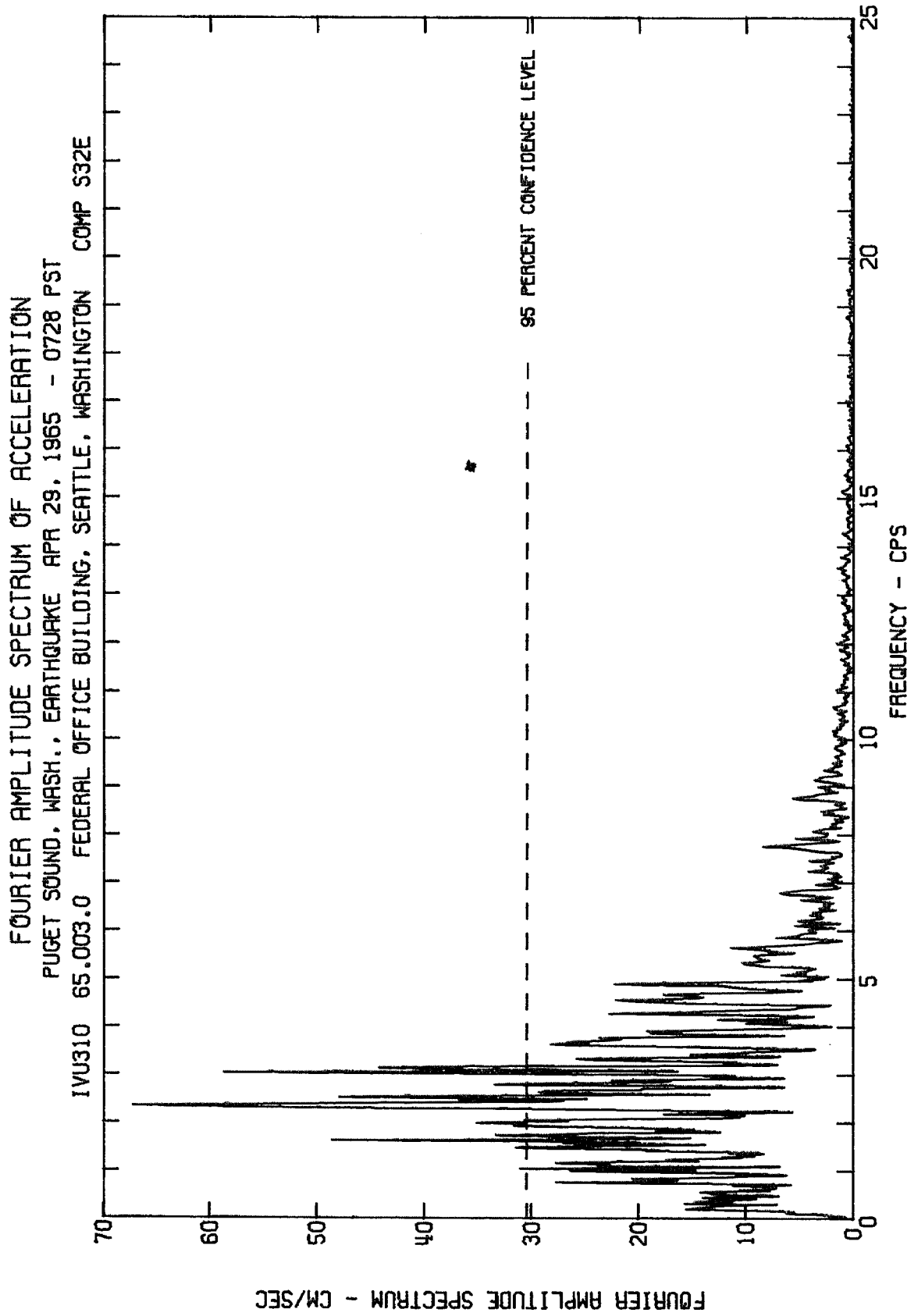


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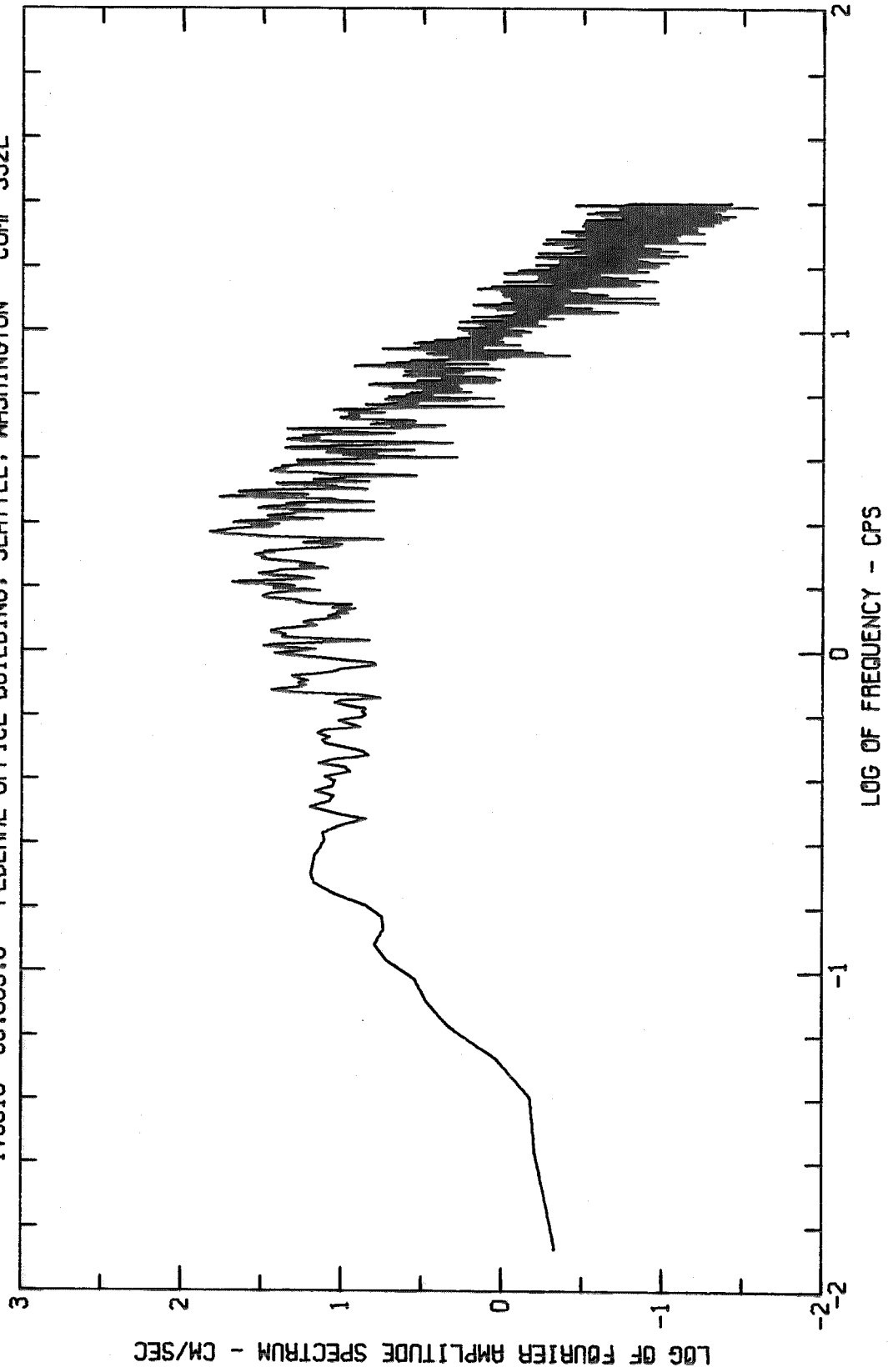


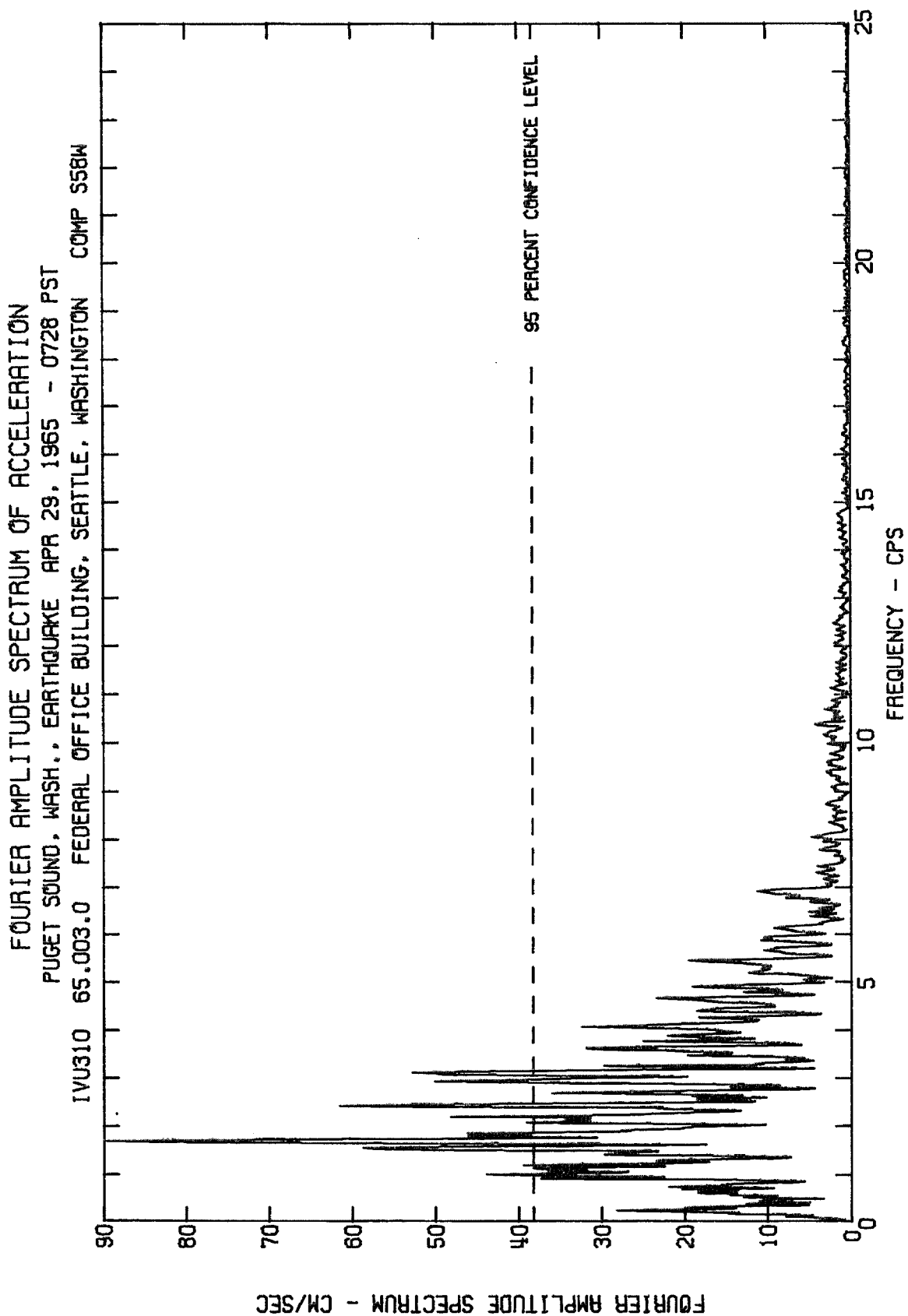
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IVU309 61.002.0 PUBLIC LIBRARY, HOLLISTER, CALIFORNIA COMP UP



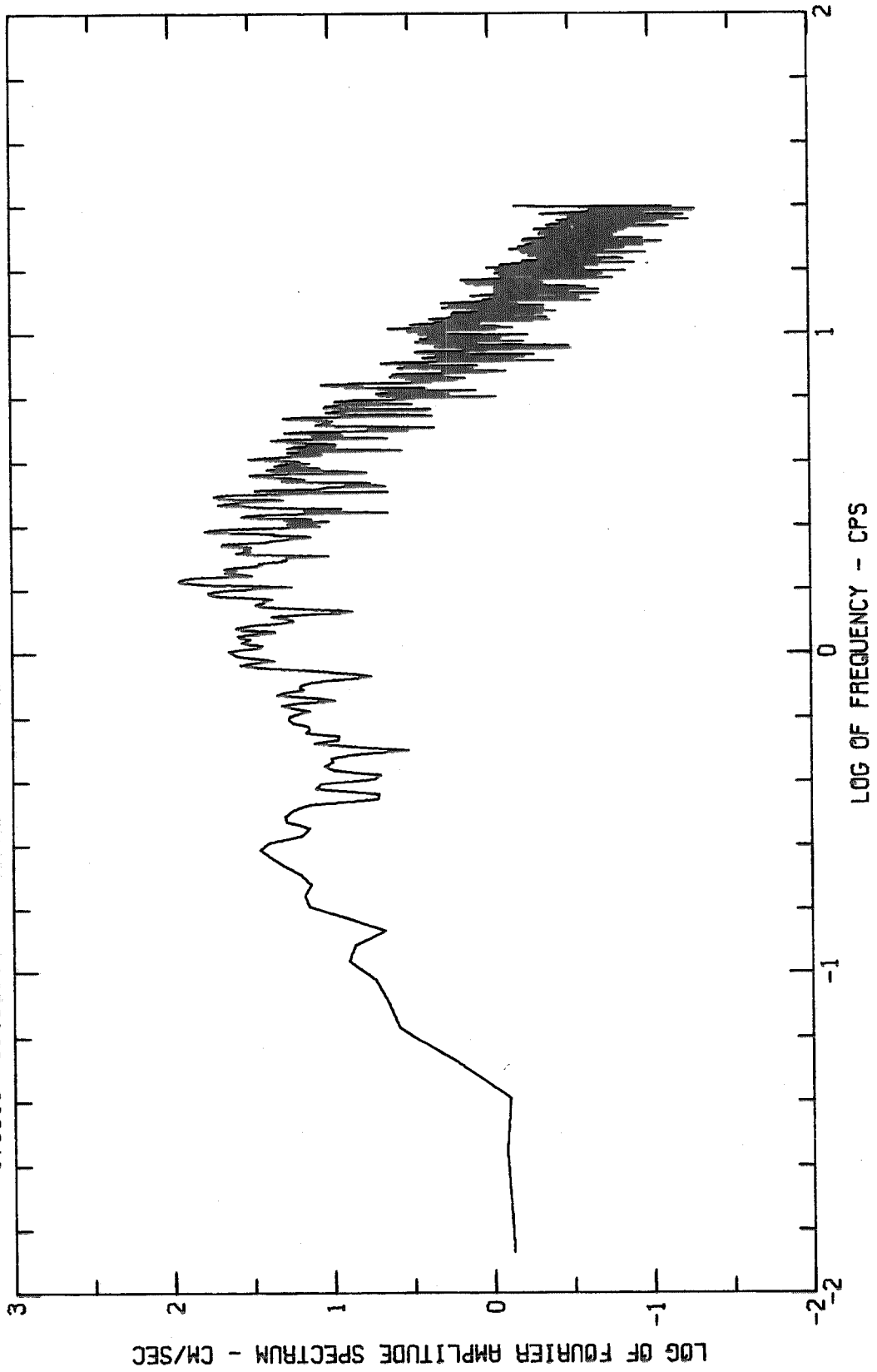


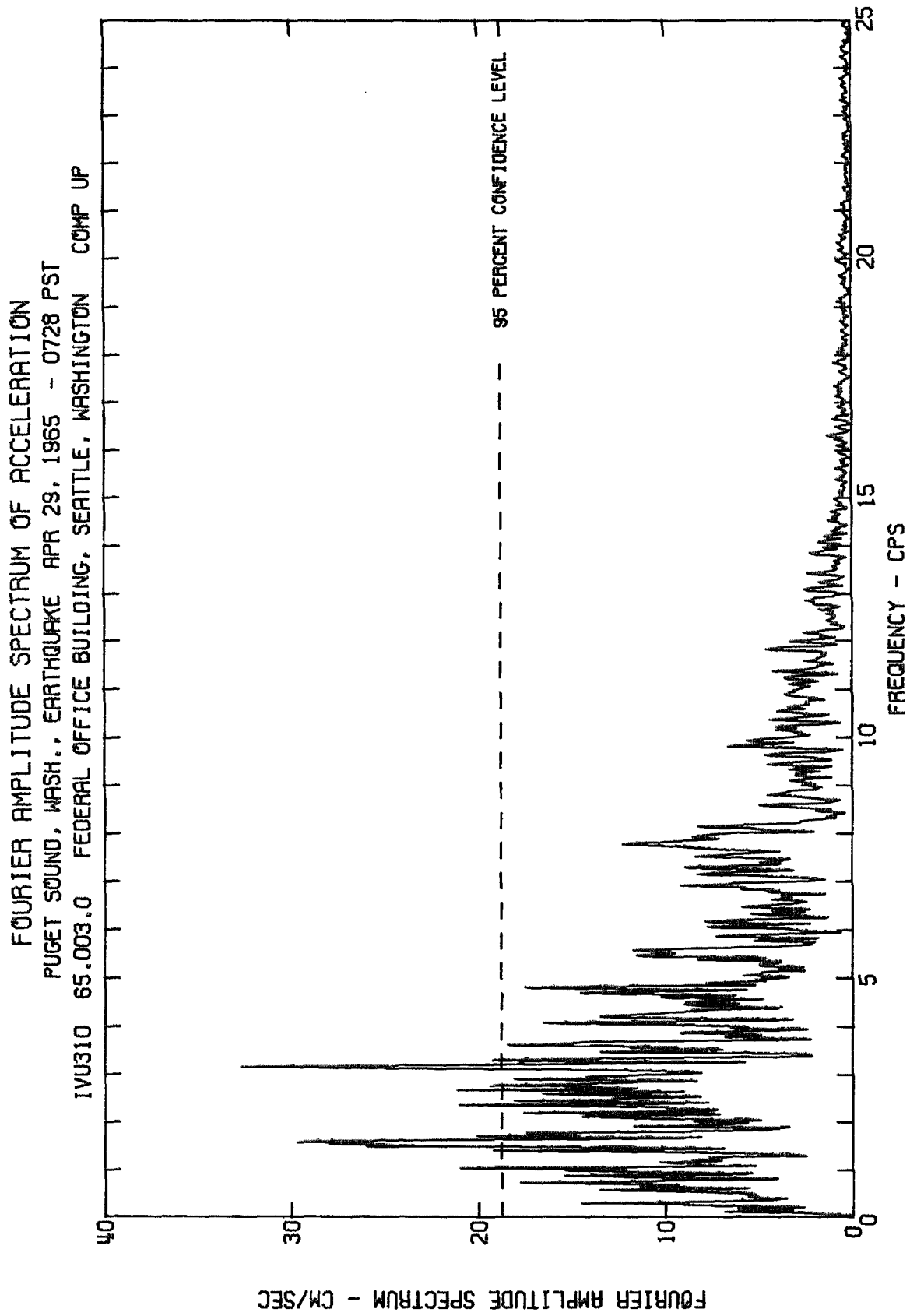
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PUGET SOUND, WASH., EARTHQUAKE APR 29, 1965 - 0728 PST  
IVU310 65.003.0 FEDERAL OFFICE BUILDING, SEATTLE, WASHINGTON COMP S32E





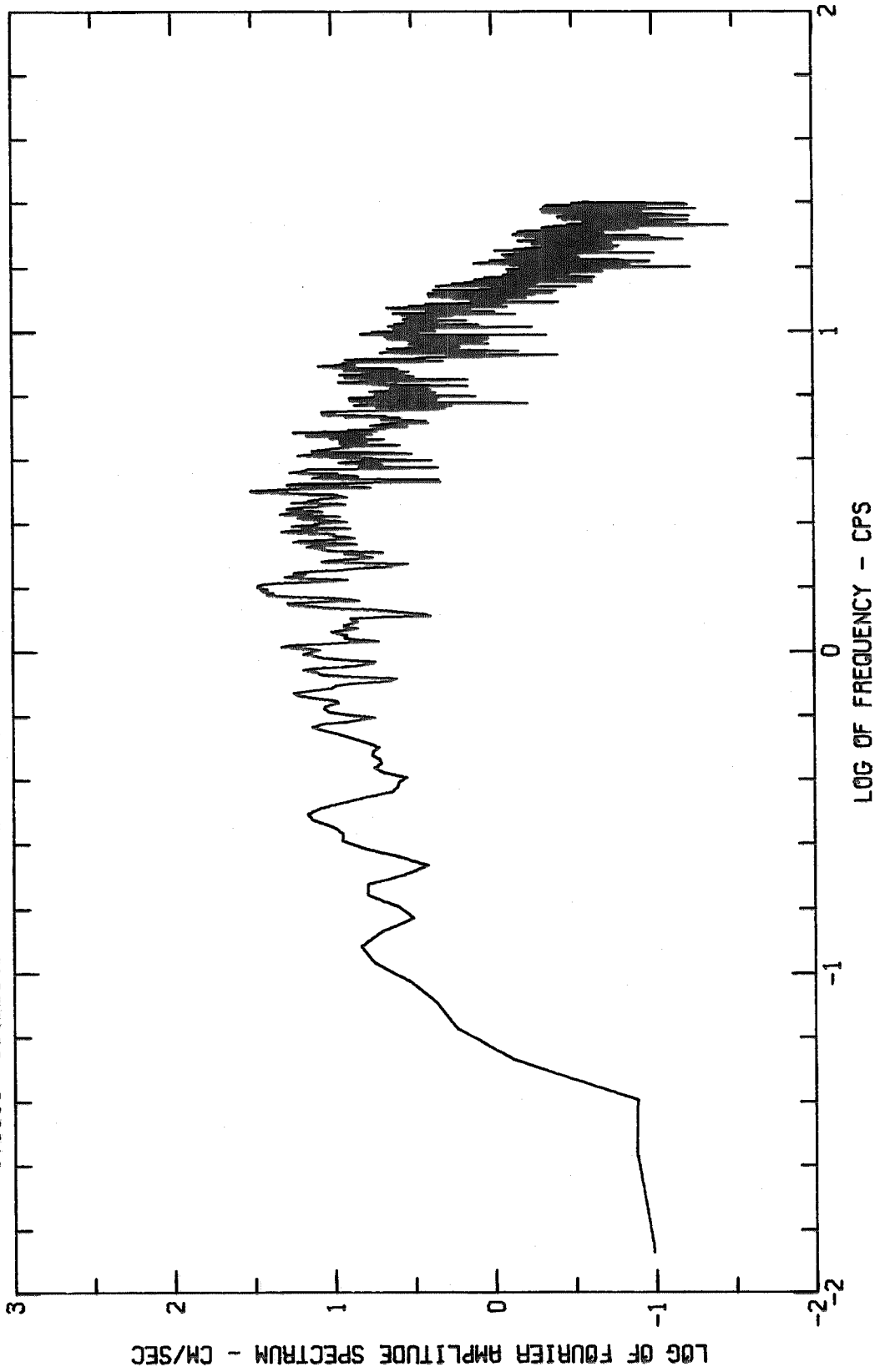
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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IVU310 65.003.0 FEDERAL OFFICE BUILDING, SEATTLE, WASHINGTON COMP S58W



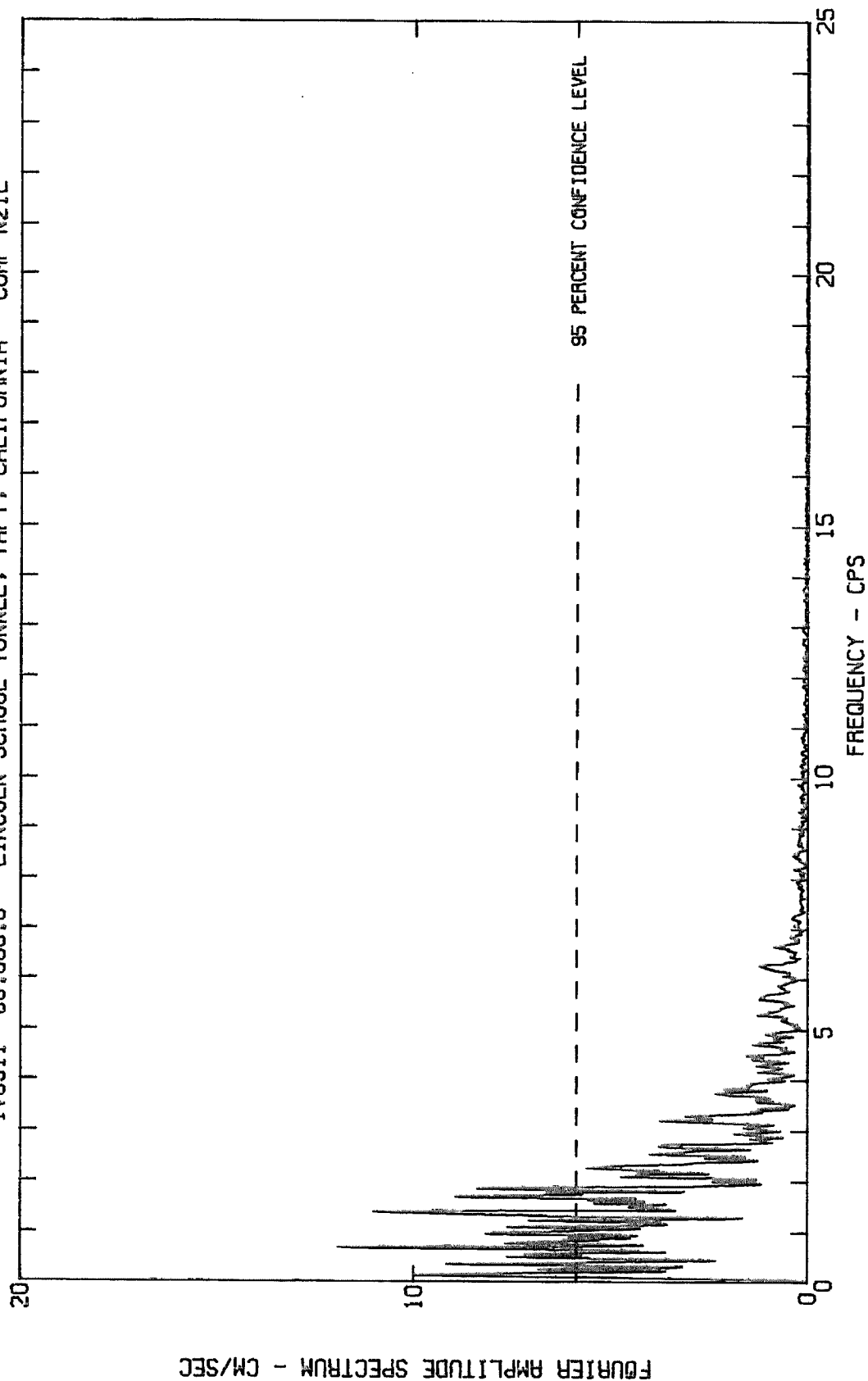




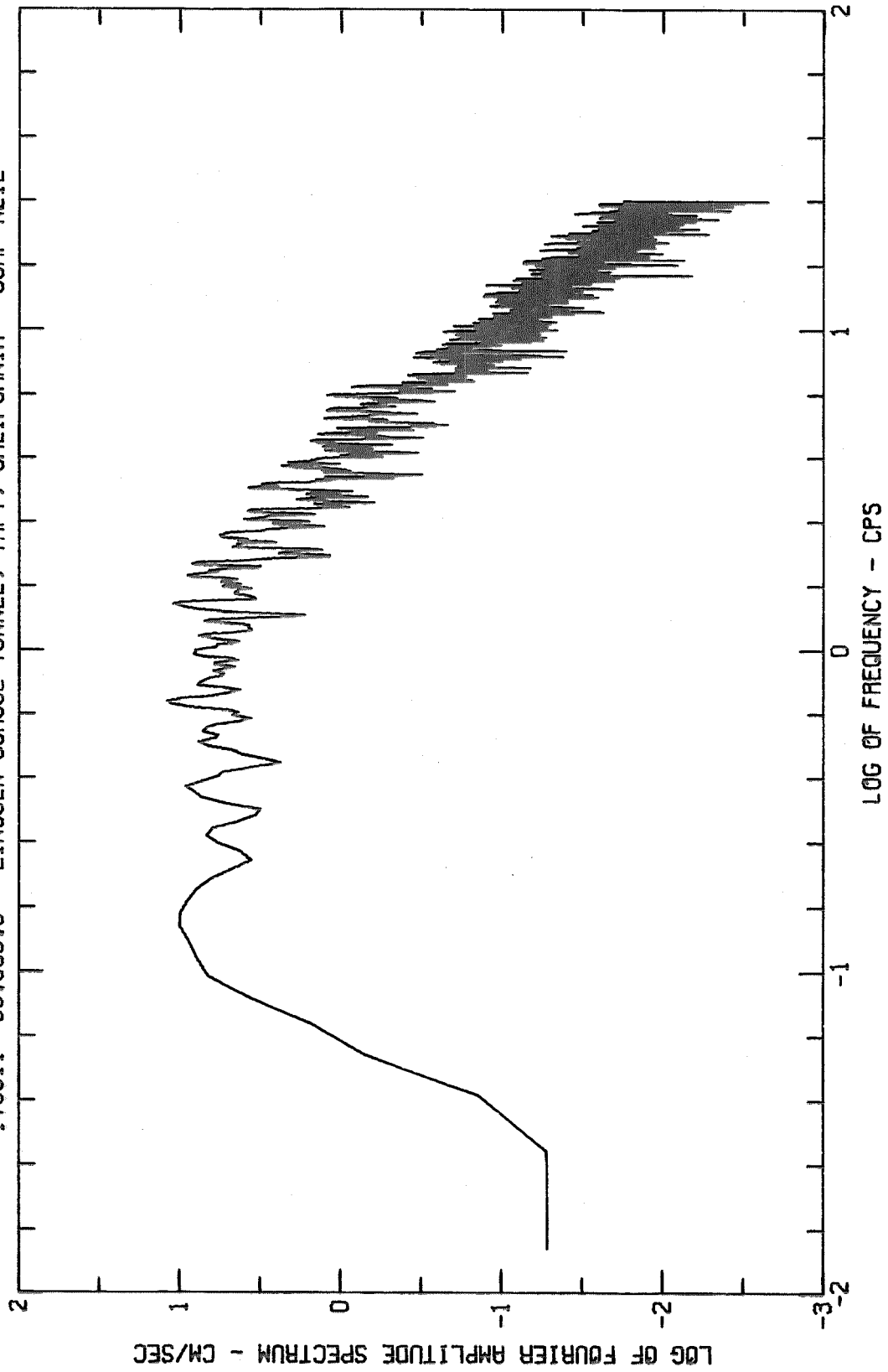
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PUGET SOUND, WASH., EARTHQUAKE APR 29, 1965 - 0728 PST  
1VU310 65.003.0 FEDERAL OFFICE BUILDING, SEATTLE, WASHINGTON COMP UP



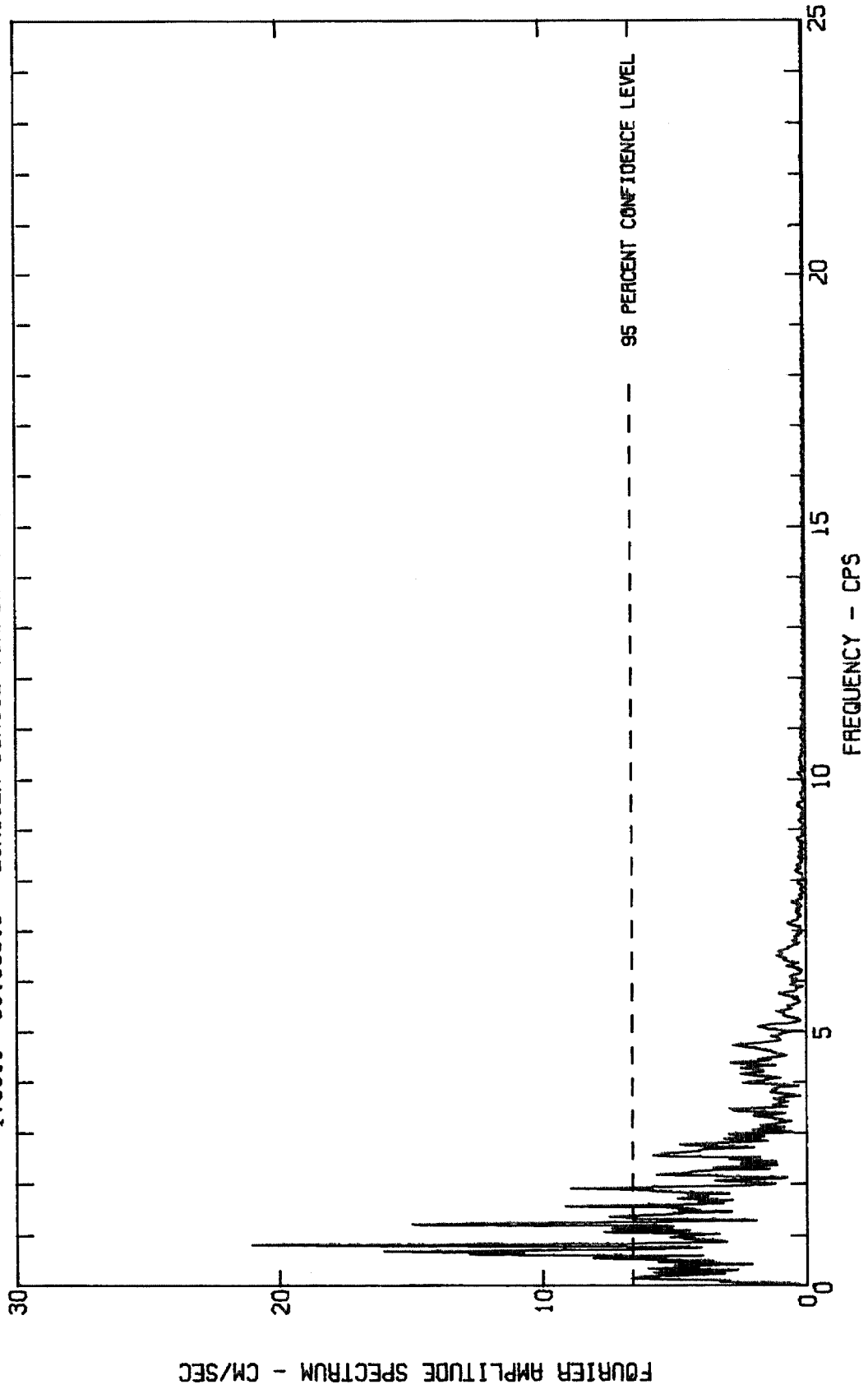
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PARKFIELD, CALIFORNIA, EARTHQUAKE JUN 27, 1966 - 2026 PST  
1VU311 66.006.0 LINCOLN SCHOOL TUNNEL, TAFT, CALIFORNIA COMP N21E



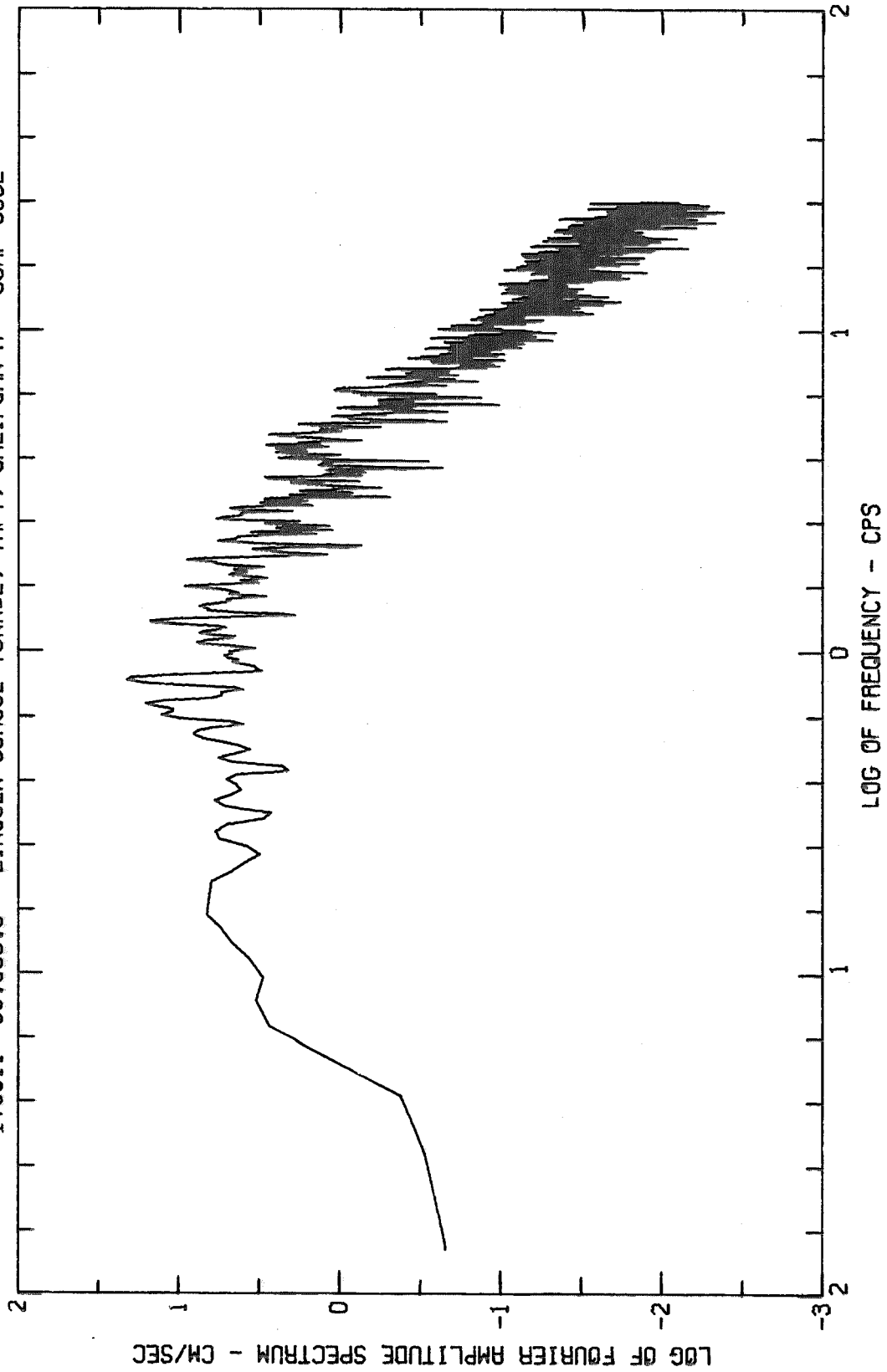
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PARKFIELD, CALIFORNIA, EARTHQUAKE JUN 27, 1966 - 2026 PST  
JVU311 66.006.0 LINCOLN SCHOOL TUNNEL, TAFT, CALIFORNIA COMP N21E



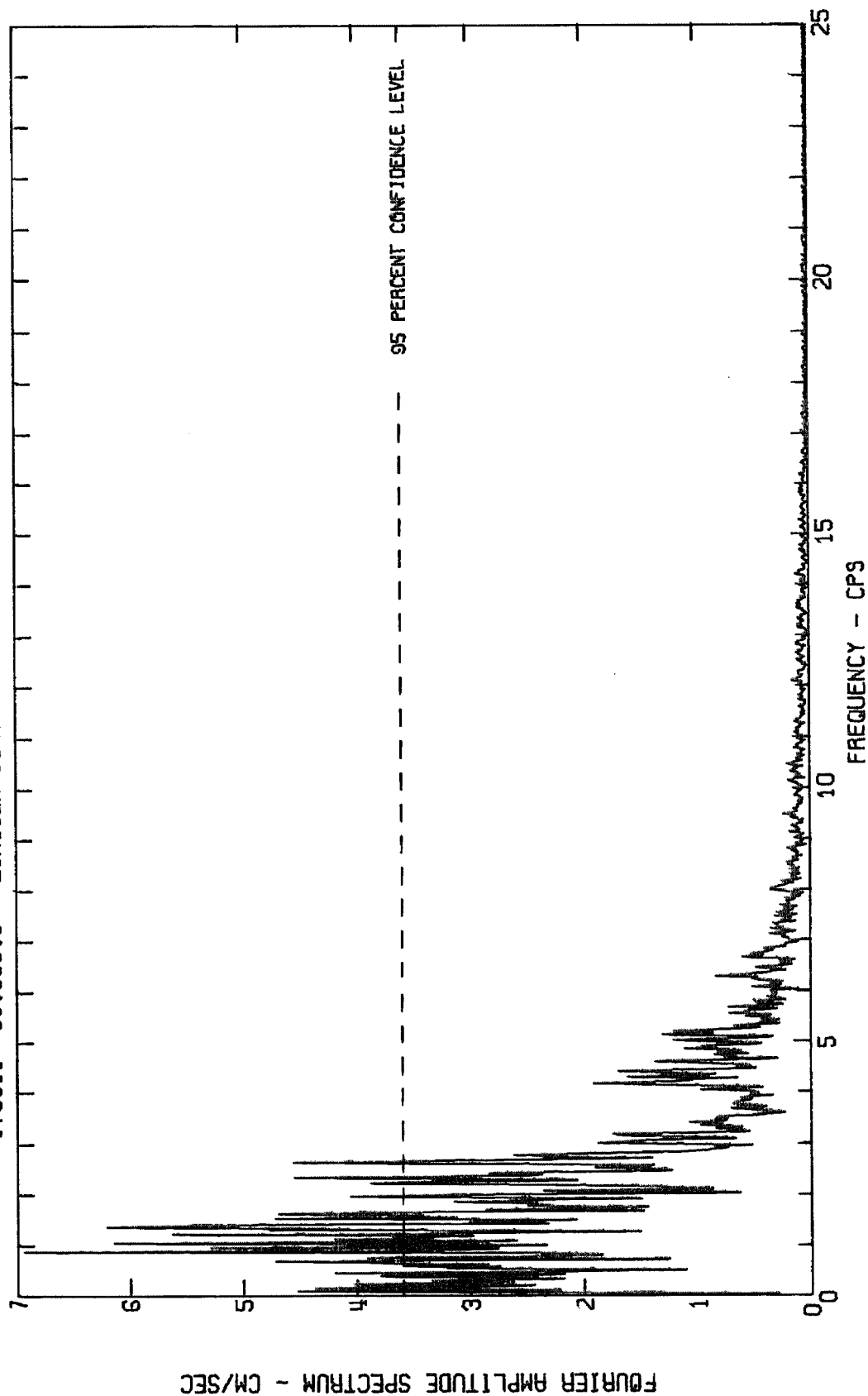
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PARKFIELD, CALIFORNIA, EARTHQUAKE JUN 27, 1966 - 2026 PST  
1VU311 66.006.0 LINCOLN SCHOOL TUNNEL, TAFT, CALIFORNIA COMP 569E



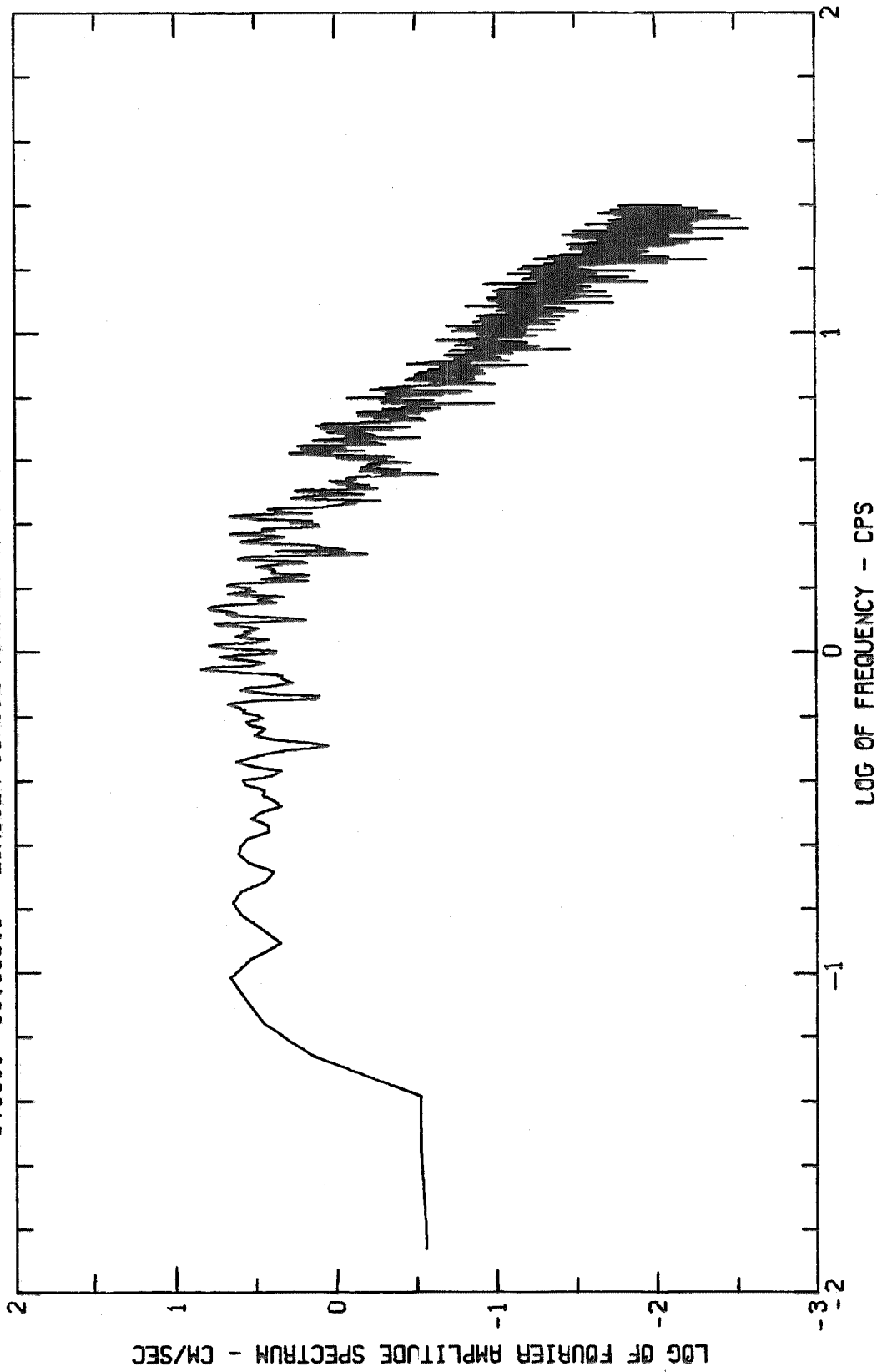
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PARKFIELD, CALIFORNIA. EARTHQUAKE JUN 27, 1966 - 2026 PST  
IVU311 66.006.0 LINCOLN SCHOOL TUNNEL, TAFT, CALIFORNIA COMP S69E



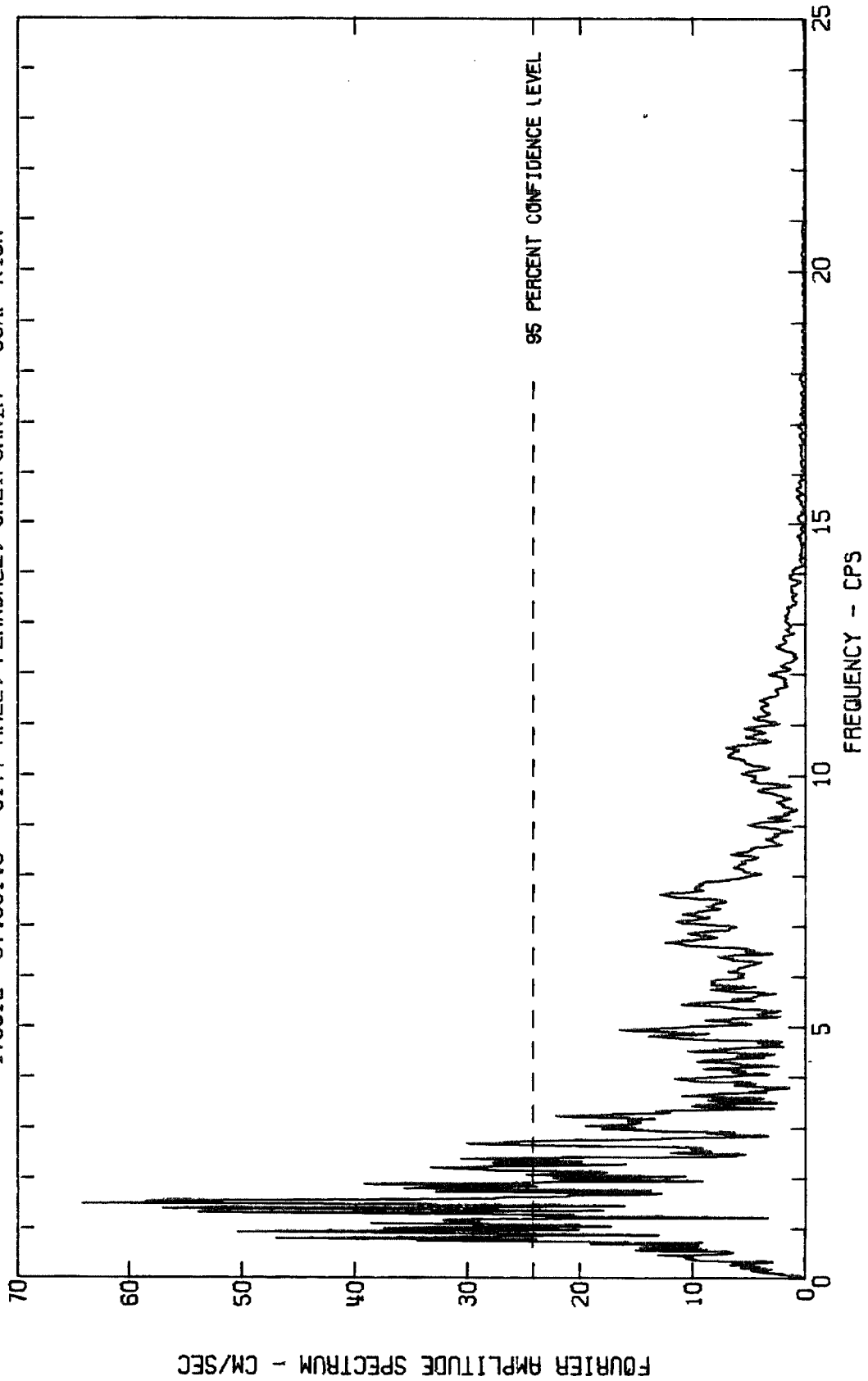
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PARKFIELD, CALIFORNIA, EARTHQUAKE JUN 27, 1966 - 2026 PST  
1VU311 66.006.0 LINCOLN SCHOOL TUNNEL, TAFT, CALIFORNIA COMP UP



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
PARKFIELD, CALIFORNIA, EARTHQUAKE JUN 27, 1966 - 2026 PST  
IVU311 66.006.0 LINCOLN SCHOOL TUNNEL, TAFT, CALIFORNIA COMP UP

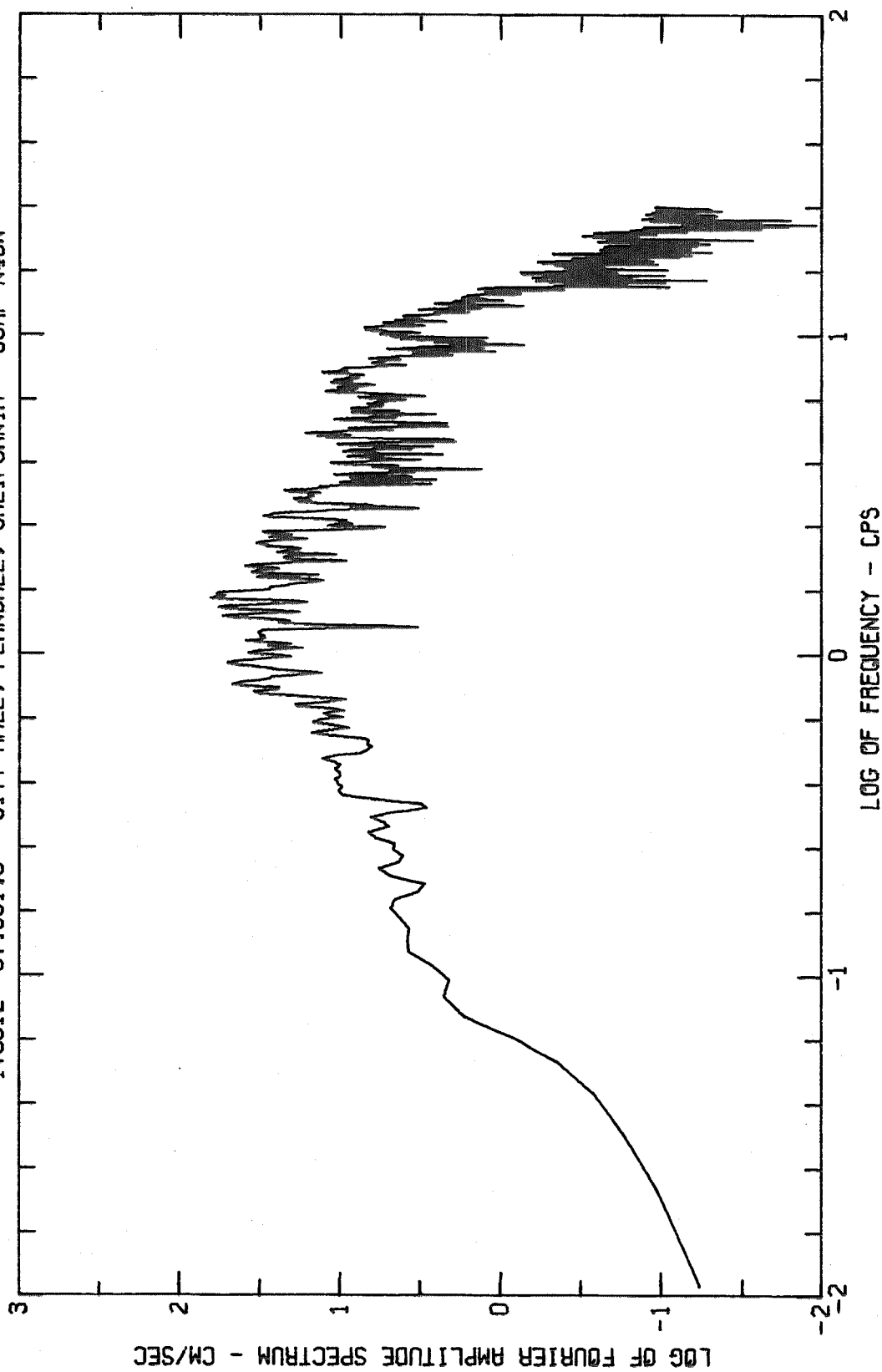


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
FERNDAL, CALIFORNIA, EARTHQUAKE DEC 10, 1967 - 0406 PST  
IVU312 67.001.0 CITY HALL, FERNDAL, CALIFORNIA COMP N46W

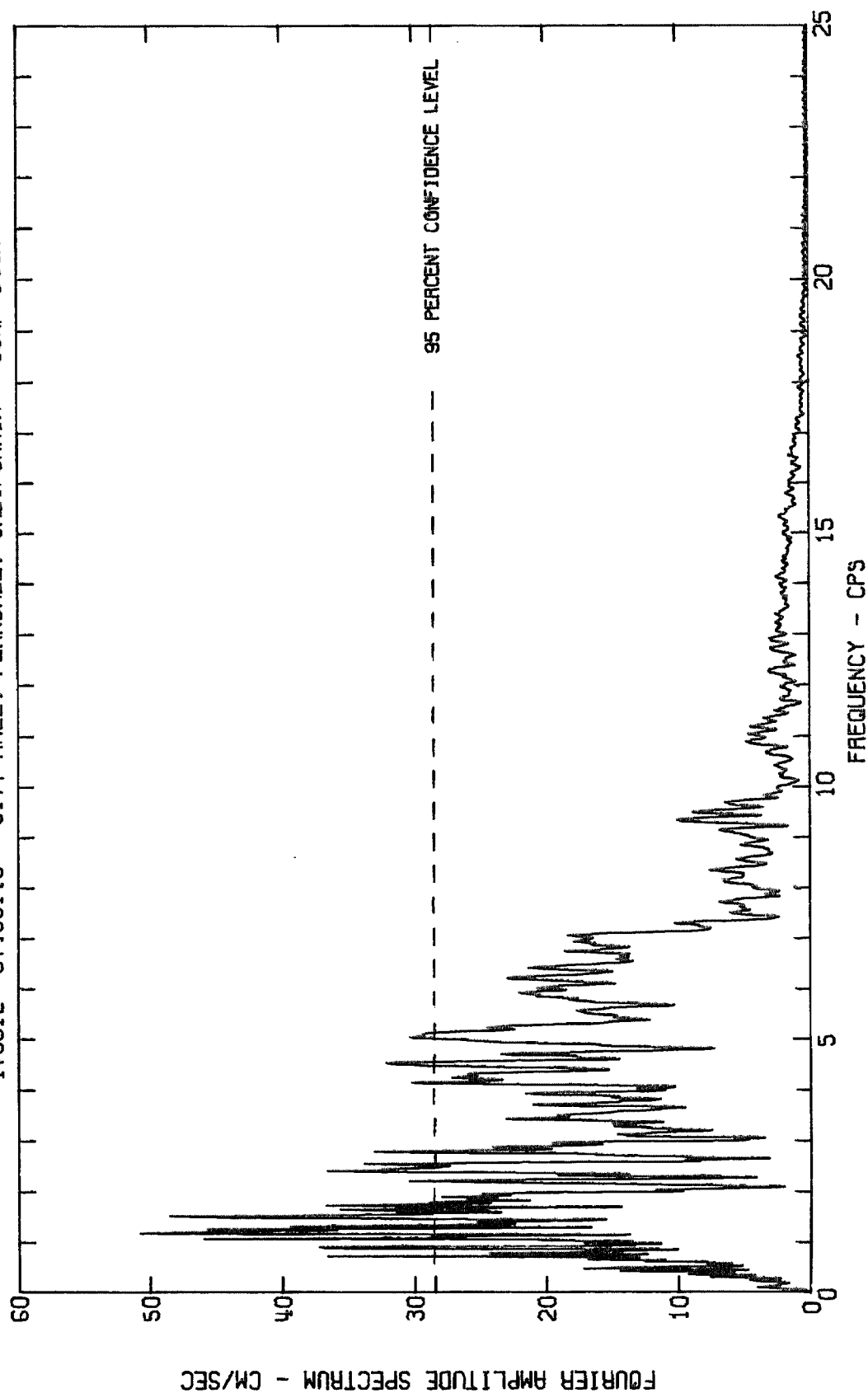




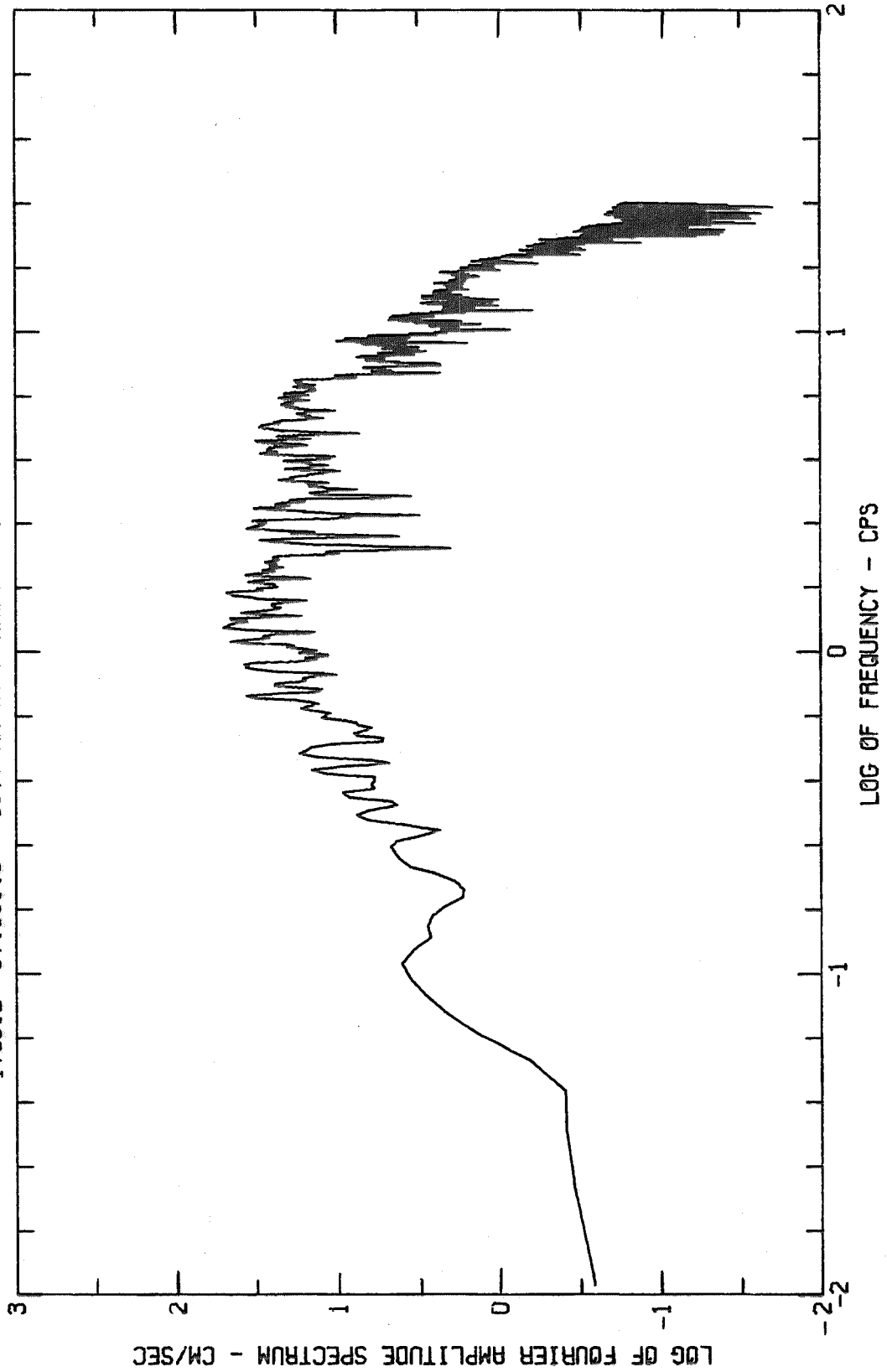
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IVU312 67.001.0 CITY HALL, FERNDAL, CALIFORNIA COMP N46W



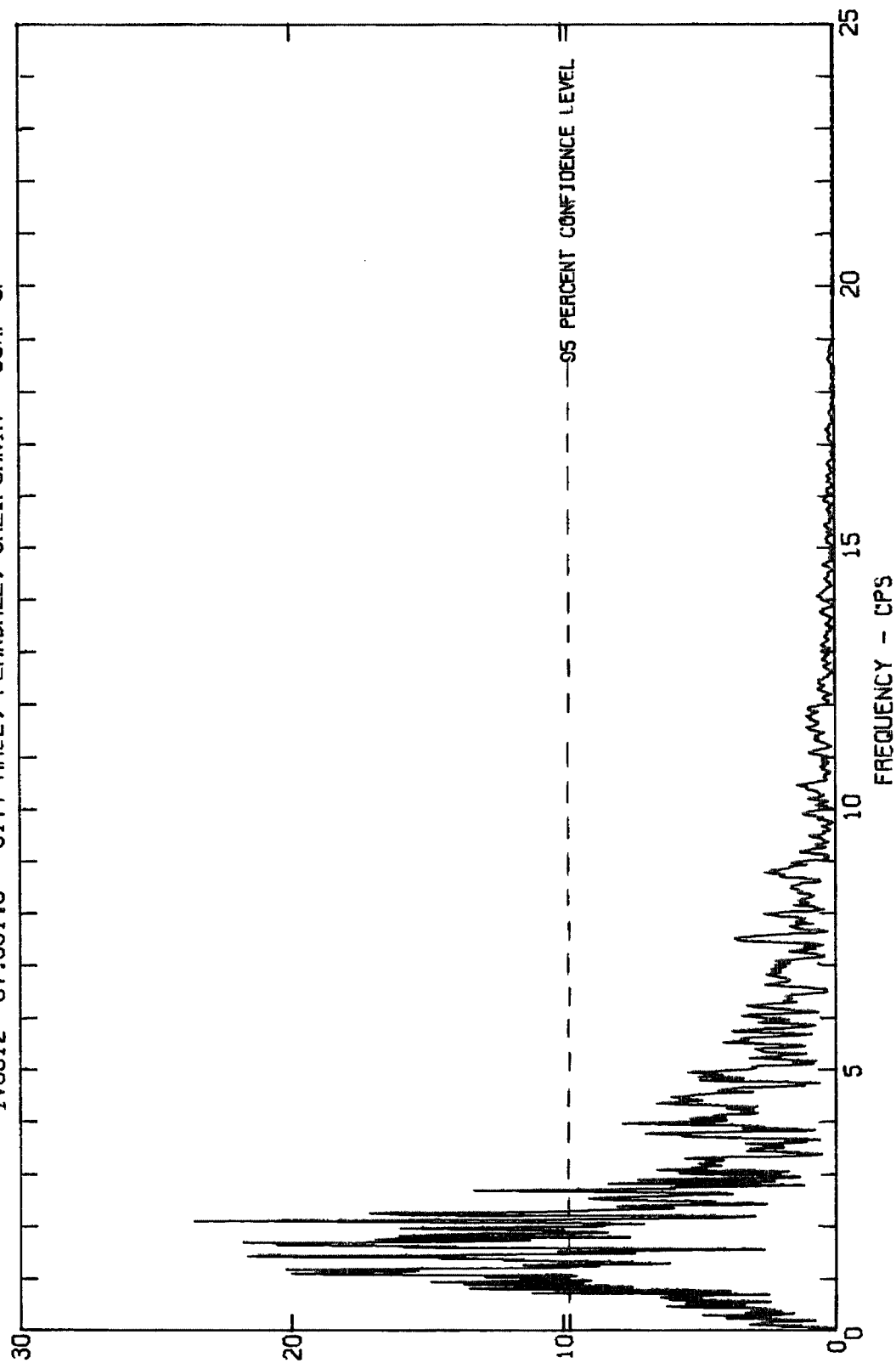
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FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
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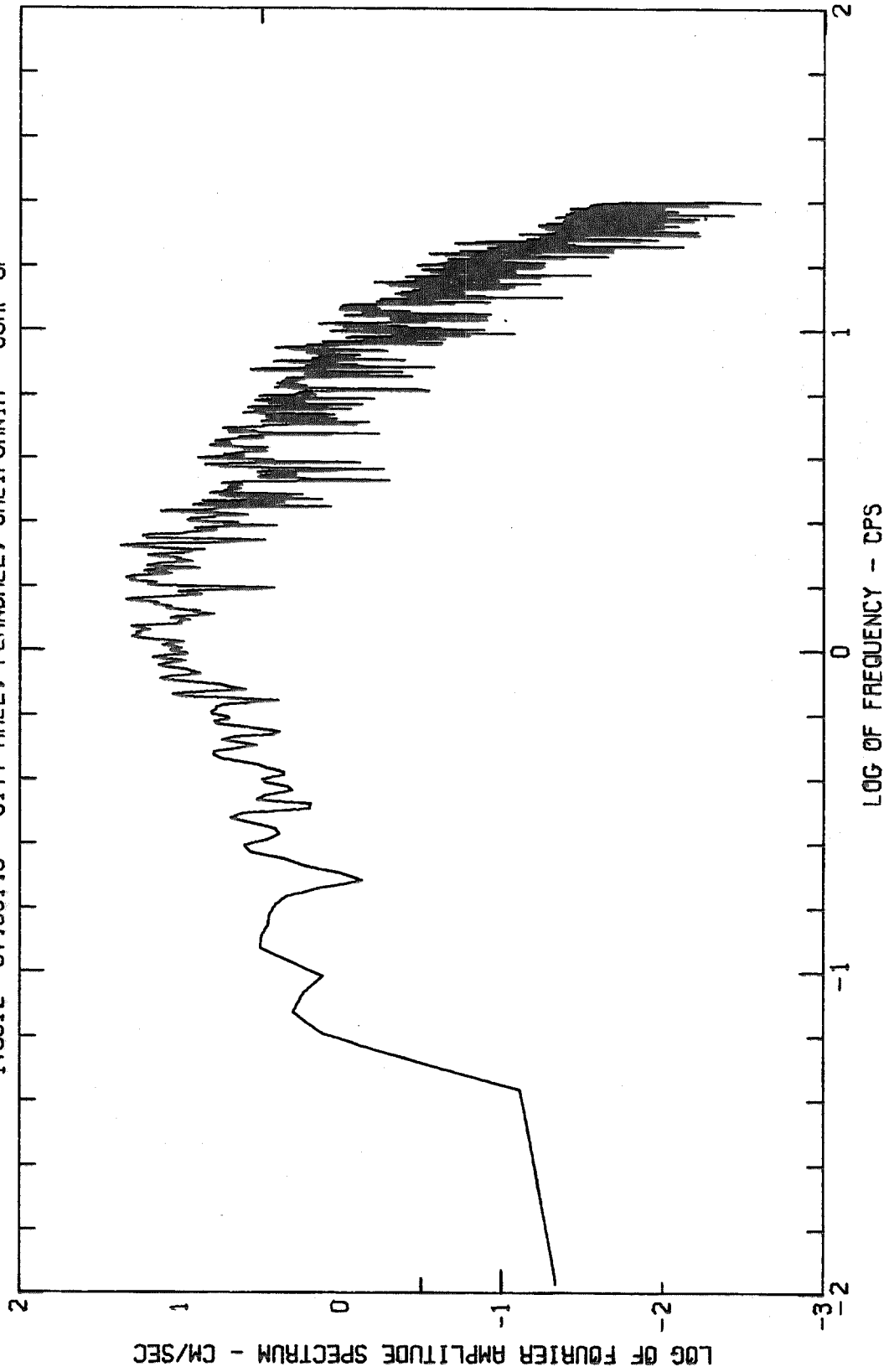


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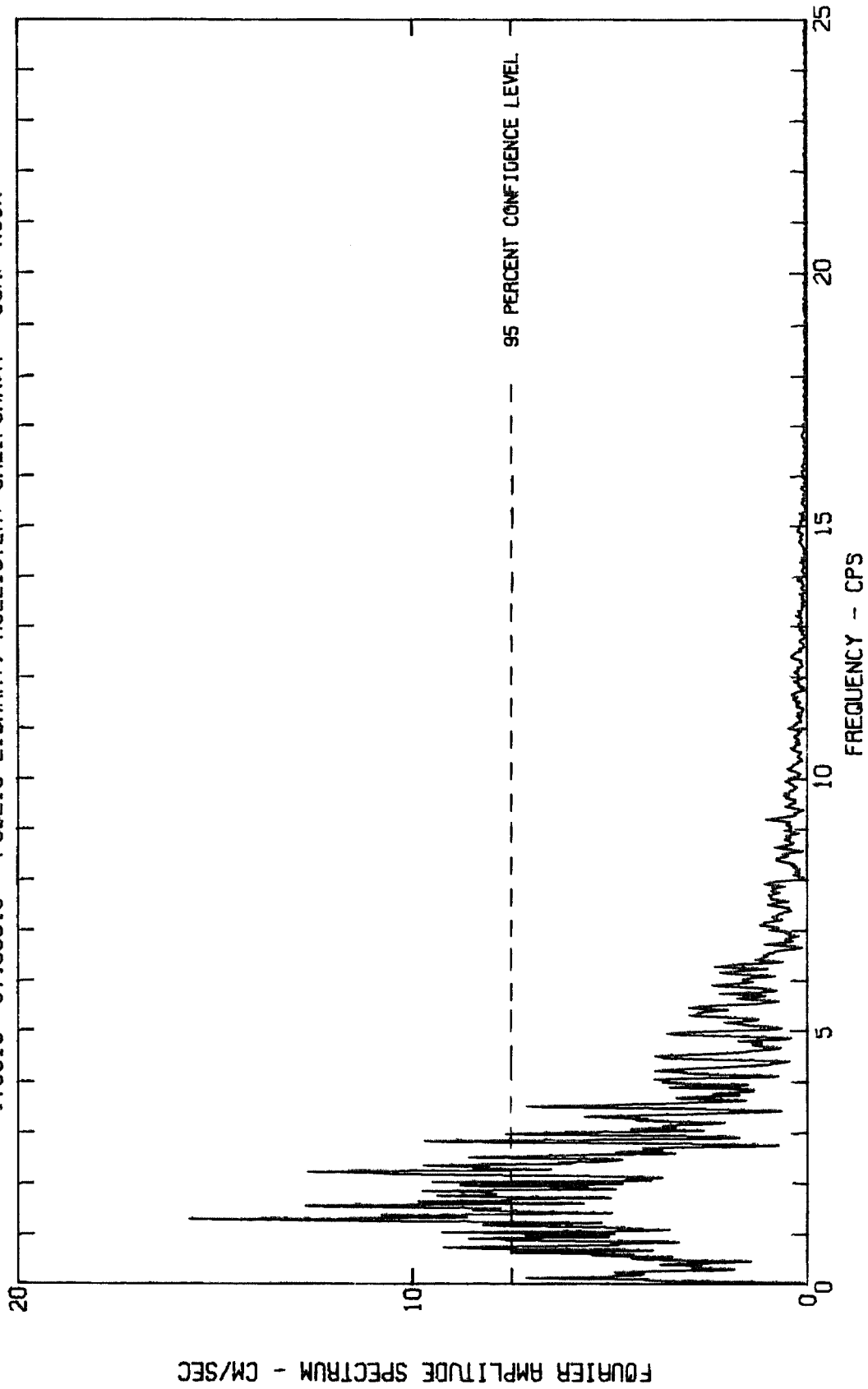


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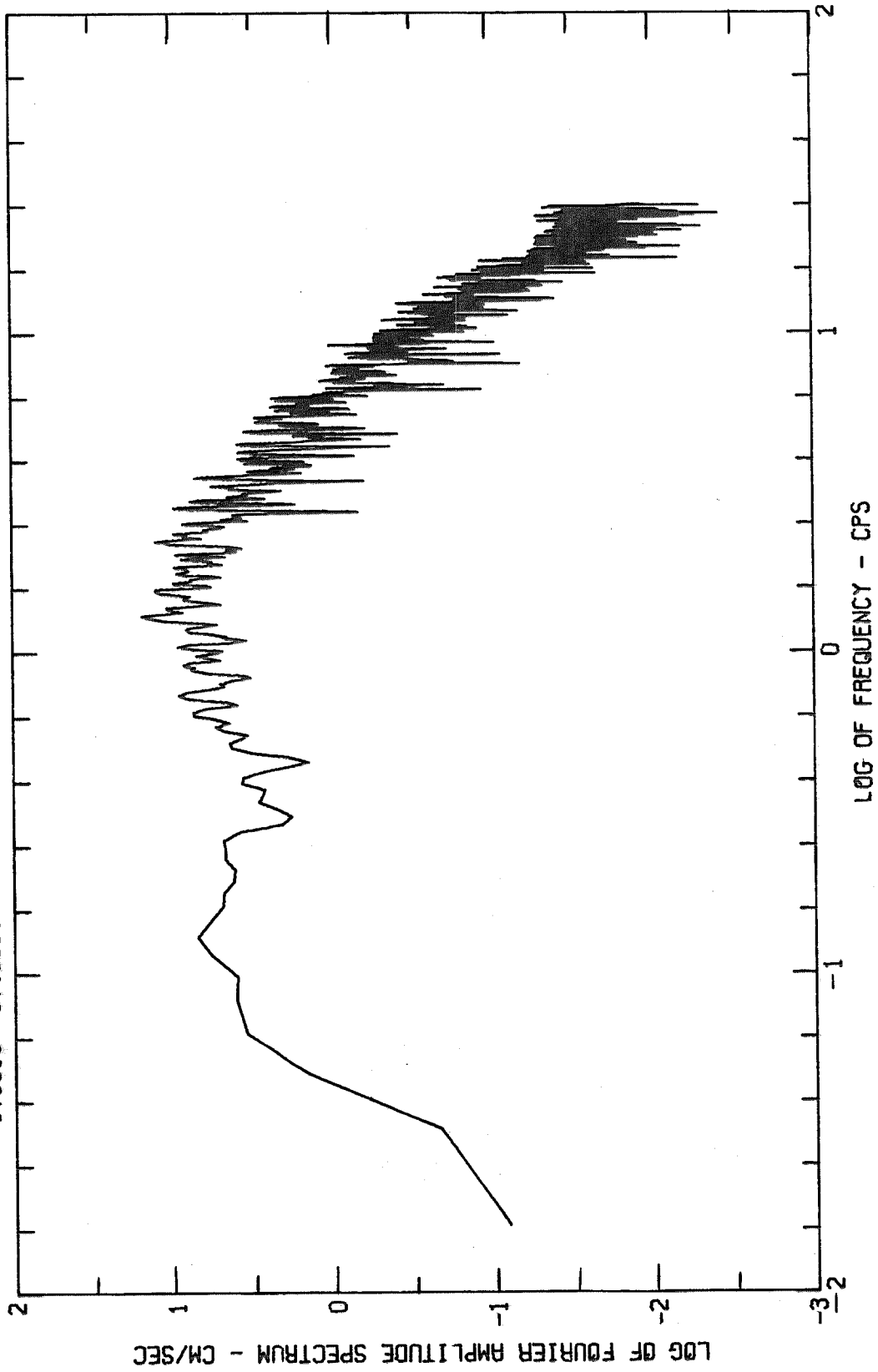
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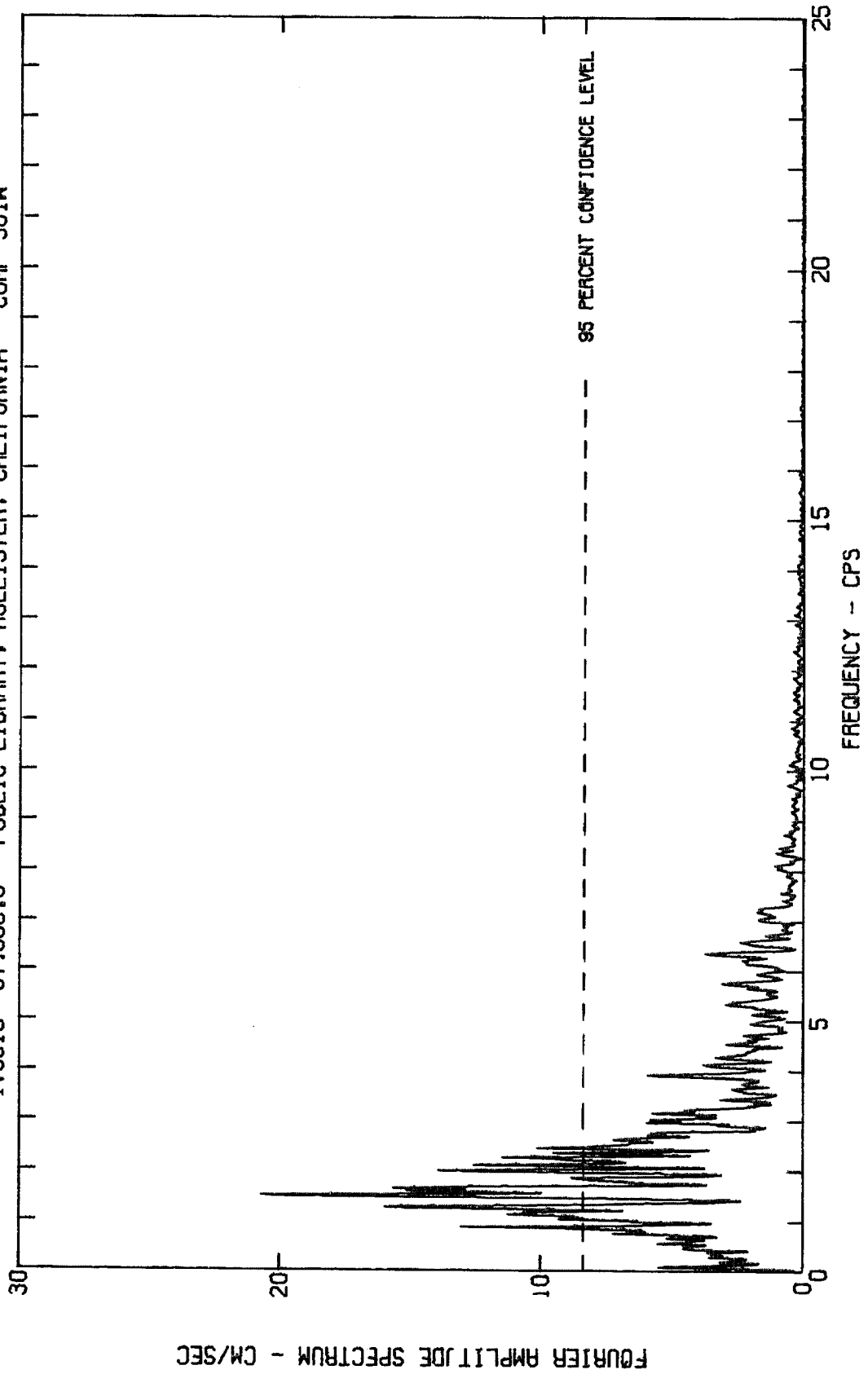
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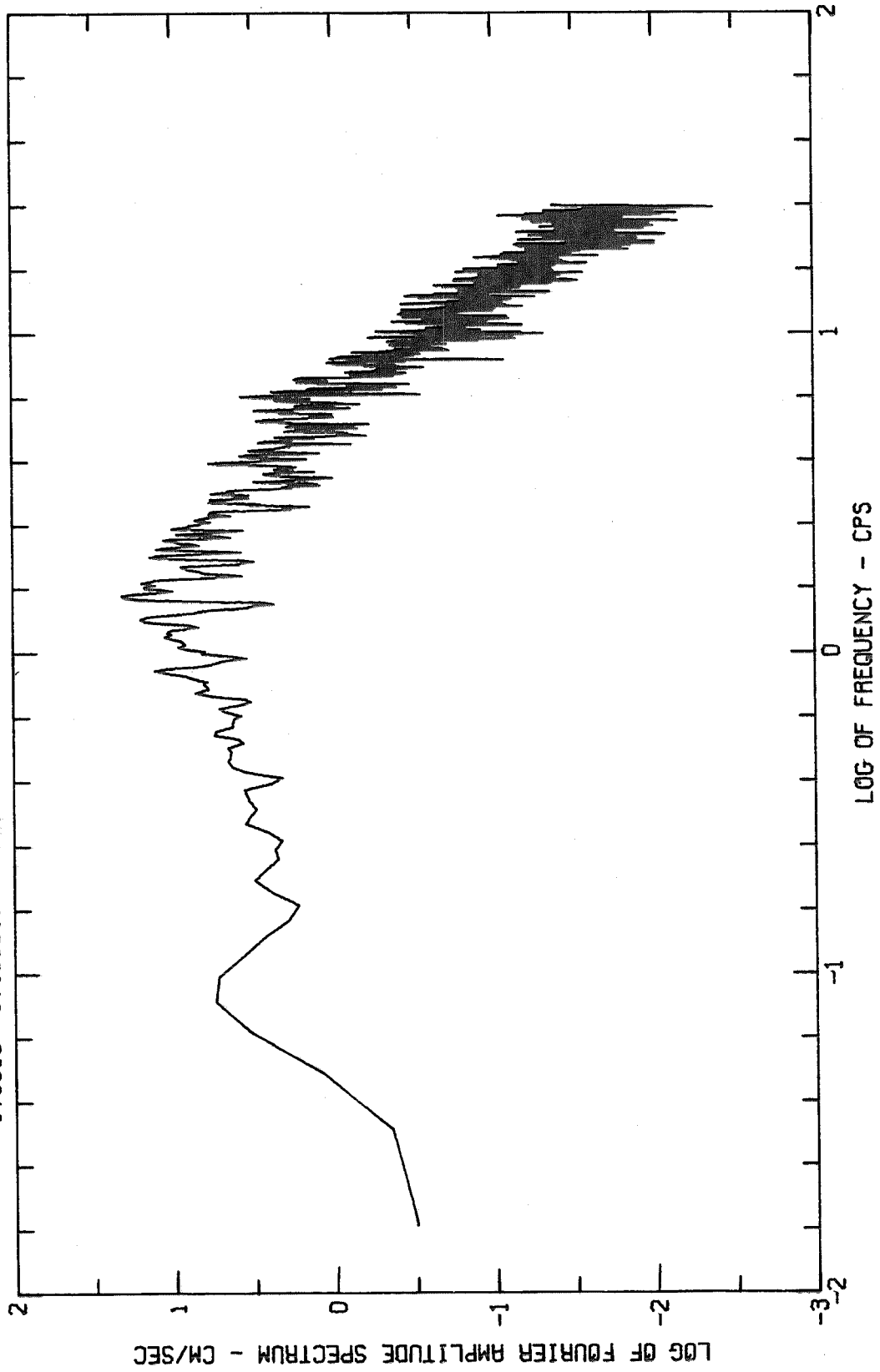


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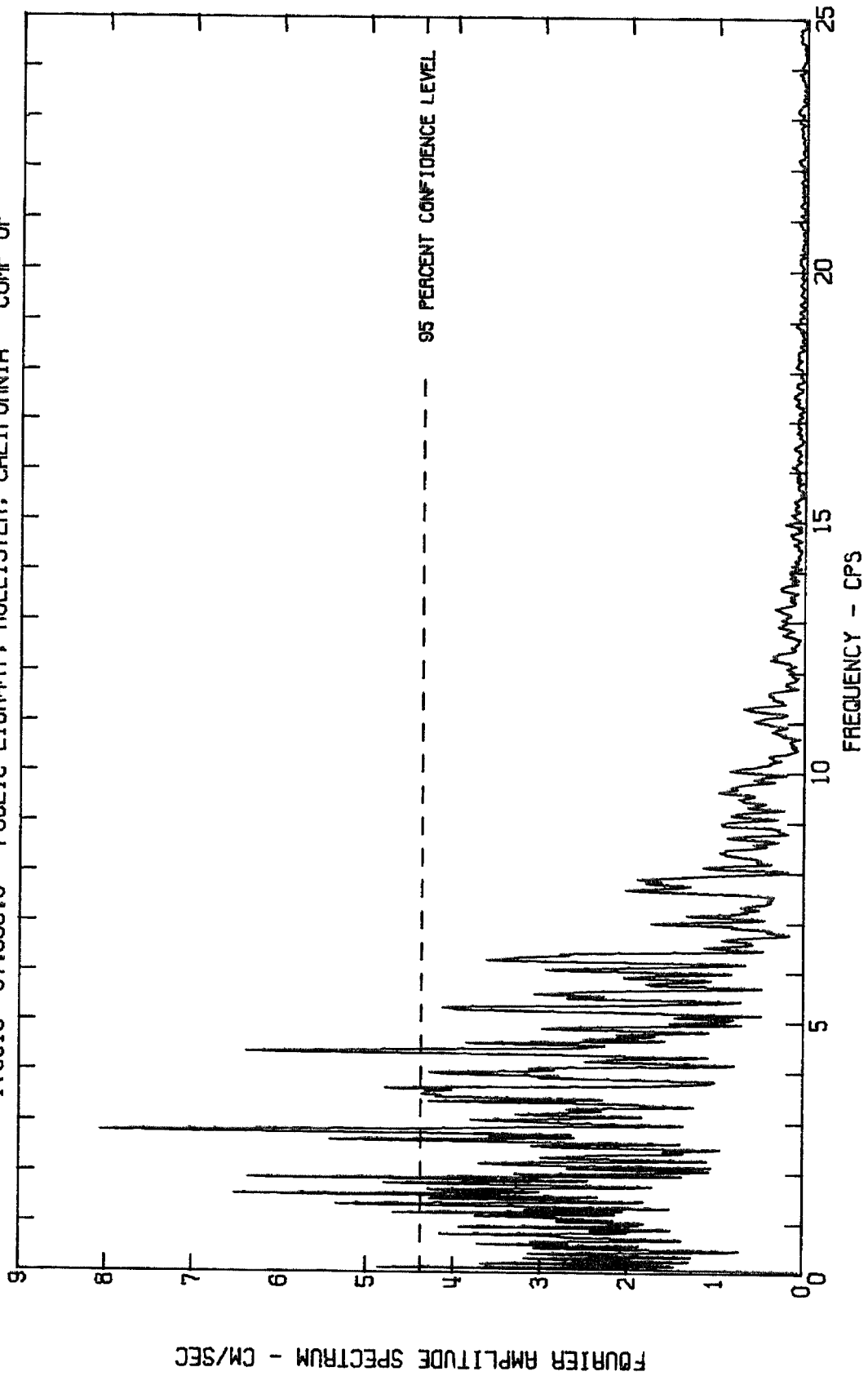




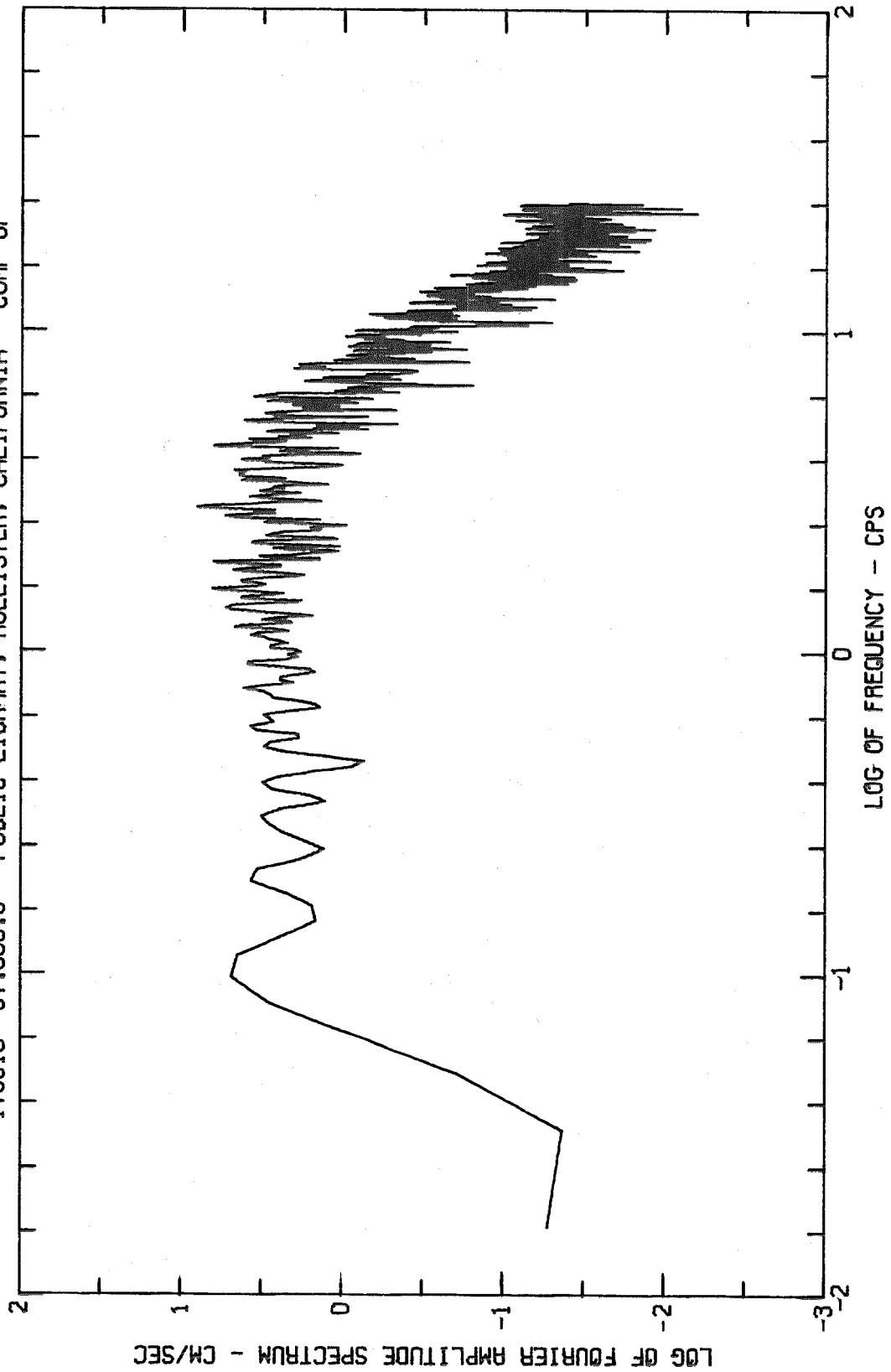
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California Institute of Technology  
Earthquake Engineering Research Laboratory

The following reports of the Earthquake Engineering Research Laboratory from 1970 on can be obtained from the National Technical Information Service, Springfield, Virginia 22121:

Strong-Motion Earthquake Accelerograms  
Digitized and Plotted Data  
Volume I

<u>Part</u>	<u>Report No.</u>	NTIS <u>Accession No.</u>
A	EERL 70-20	PB-287 847
B	EERL 70-21	PB-196 823
C	EERL 71-20	PB-204 364
D	EERL 71-21	PB-208 529
E	EERL 71-22	PB-209 749
F	EERL 71-23	PB-210 619
G	EERL 72-20	PB-211 357
H	EERL 72-21	PB-211 781
I	EERL 72-22	PB-213 422
J	EERL 72-23	PB-213 423
K	EERL 72-24	PB-213 424
L	EERL 72-25	PB-215 639
M	EERL 72-26	PB-220 554
N	EERL 72-27	PB-223 023
O	EERL 73-20	PB-222 417
P	EERL 73-21	PB-227 481/AS
Q	EERL 73-22	PB-232 315/AS
R	EERL 73-23	PB-239 585/AS

Strong-Motion Earthquake Accelerograms  
Digitized and Plotted Data

Corrected Accelerograms and Integrated  
Ground Velocity and Displacement Curves

Volume II

<u>Part</u>	<u>Report No.</u>	NTIS <u>Accession No.</u>
A	EERL 71-50	PB-208 283
B	EERL 72-50	PB-220 161
C	EERL 72-51	PB-220 162
D	EERL 72-52	PB-220 836
E	EERL 73-50	PB-223 024
F	EERL 73-51	PB-224 977/9AS
G	EERL 73-52	PB-229 239/AS
H	EERL 74-50	PB-231 225/AS
I	EERL 74-51	PB-232 316/AS
J, K	EERL 74-52	PB-233 257/AS
L, M	EERL 74-53	PB-237 174/AS
N	EERL 74-54	PB-236 399/AS
O, P	EERL 74-55	PB-239 586/AS
Q, R	EERL 74-56	PB-239 587/AS

Analyses of Strong-Motion Earthquake Accelerograms  
Response Spectra

Volume III

<u>Part</u>	<u>Report No.</u>	NTIS <u>Accession No.</u>
A	EERL 72-80	PB-212 602
B	EERL 73-80	PB-221 256
C	EERL 73-81	PB-223 025
D	EERL 73-82	PB-227 469/AS
E	EERL 73-83	PB-227 470/AS
F	EERL 73-84	PB-227 471/AS
G	EERL 73-85	PB-231 223/AS
H	EERL 74-80	PB-231 319/AS
I	EERL 74-81	PB-232 326/AS
J, K, L	EERL 74-82	PB-236 110/AS
M, N	EERL 74-83	PB-236 400/AS
O, P	EERL 74-84	PB-238 102/AS

Analyses of Strong-Motion Earthquake Accelerograms  
Fourier Amplitude Spectra

Volume IV

<u>Part</u>	<u>Report No.</u>	<u>NTIS Accession No.</u>
A	EERL 72-100	PB-212 603
B	EERL 73-100	PB-220 837
C	EERL 73-101	PB-222 514
D	EERL 73-102	PB-222 969/AS
E	EERL 73-103	PB-229 240/AS
F	EERL 73-104	PB-229 241/AS
G	EERL 73-105	PB-231 224/AS
H	EERL 74-100	PB-232 327/AS
I	EERL 74-101	PB-232 328/AS
J, K, L, M	EERL 74-102	PB-236 111/AS
N, O, P	EERL 74-103	PB-238 447/AS

Strong-Motion Instrumental Data on the San Fernando Earthquake of February 9, 1971, (PB-204 198)

P. C. Jennings, et al, Forced Vibration of a 22-Story Steel Frame Building (EERL 71-01; PB-205 161)

P. C. Jennings, ed., Engineering Features of the San Fernando Earthquake (EERL 71-02; PB-202 550)

Randolph A. Adu, Response and Failure of Structures under Stationary Random Excitation (EERL 71-02; PB-205 304)

Jacobo Bielak, Earthquake Response of Building-Foundation Systems (EERL 71-04; PB-205 305)

M. D. Trifunac, F. E. Udwadia, A. G. Brady, High Frequency Errors and Instrument Corrections of Strong-Motion Accelerograms (EERL 71-05; PB-205 369)

Knut Sverre Skattum, Dynamic Analysis of Coupled Shear Walls and Sandwich Beams (EERL 71-06; PB-205 267)

John Brent Hoerner, Modal Coupling and Earthquake Response of Tall Buildings (EERL 71-07; PB-207 635)

P. C. Jennings and J. Bielak, Dynamics of Building-Soil Interaction (EERL 72-01; PB-209 666)

F. E. Udwadia, Investigation of Earthquake and Microtremor Ground Motions (EERL 72-02; PB-212 853)

Albert W. Whitney, On Insurance Settlements Incident to the 1906 San Francisco Fire (DRC 72-01; PB-213 256)

J. H. Wood, Analysis of the Earthquake Response of a Nine-Story Steel Frame Building during the San Fernando Earthquake (EERL 72-04; PB-215 823)

F. E. Udwadia and M. D. Trifunac, The Fourier Transform, Response Spectra and their Relationship through the Statistics of Oscillator Response (EERL 73-01; PB-220 458)

Research Papers Submitted to the Fifth World Conference on Earthquake Engineering, Rome, Italy, 25-29 June 1973 (EERL 73-02; PB-220 431)

Earthquakes and Insurance, Published Papers on Earthquake Research Affiliates Conference of 2-3 April 1973 (DRC 73-02; PB-223 033)

M. D. Trifunac and V. Lee, Routine Computer Processing of Strong-Motion Accelerograms (EERL 73-03; PB-226 047/AS)